COMPUTERWORLD

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NEWSPAPER

M Takes Distributed Processing Plunge

oftware Unbundled • 8100 Features 64K Chip

By E. Drake Lundell Jr.
CW Staff

WHITE PLAINS, N.Y. — IBM completely unbundled its operating system software from the price of hardware with the announcement of the 8100 information system here last week.

Instead of supplying operating systems with the processor, as has been the IBM tradition, the two operating systems for the 8100 carry price tags. All of the utility software is also priced separately.

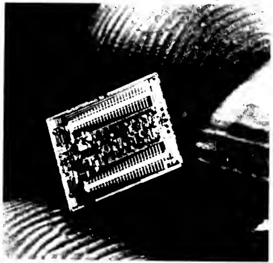
In addition to the pricing scheme, the software also features a programming aid that uses English language statements to lead operators through the creation of application programs, then automatically translates the operator's instructions into Cobol, IBM said.

While the systems are incapable of running IBM 370 applications, the operating systems do accommodate programs developed for the 3790 clustered terminal communications system.

The Distributed Processing Programming Executive (DPPX) can be used on an 8100 running either in stand-alone mode or as part of a distributed processing system. The second operating system introduced, the Distributed Processing Control Executive (DPCX), can be used only in networks that are tightly controlled by a host 370 mainframe.

IBM has offered completely unbundled operating systems only on one other product — the Series/1 from its General Systems Division, which is sold primarily in the stripped-down

(Continued on Page 4)



This tiny 64K-bit chip — the densest IBM has ever produced — is the heart of the 8100 information system announced last week. See story on Page 4.

WHITE PLAINS, N.Y. — IBM jumped head first into distributed processing last week with the announcement of the 8100, a system that features new 64K-bit chip memory technology and aggressive pricing but won't be available for at least a year.

The system is one of the first from IBM to come completely unbundled, meaning users may be paying almost as much for software as for hardware.

For example, while the smallest 8100 processor with storage and disk leases for as little as $780/mo, a full complement of operating system software for a processor could run as high as $850/mo on license.

In other pricing actions, the use of the 64K-bit memory chips has allowed IBM to reduce the price of a 256K-byte memory increment to $4,500, while it remains at about $27,500 for the 370 and Series 30 computers.

While the 8100 is in many ways a replacement for the firm's 3790 clustered terminal system, it is in reality much more than that. The system, which will be sold by the firm's Data Processing Division here, can be used as a stand-alone processor or linked with IBM 370s or other 8100s as part of "a cooperative network processing plan," which seems to be IBM's buzzword for distributed data processing.

In either mode of operation, IBM claimed "portions" of the system can be installed by users "with a set of easy-to-follow directions — in much the same way as a basic household stereo system might be set up." Programs are loaded from diskettes.

While the 8100 operating as a stand-alone processor cannot run 370 programs, when linked to a 370 in a network it can access central computer program libraries, data files and diagnostic services and use the 370's power for peak load processing, IBM said. In addition, the host can pass computing jobs to the 8100s in the network to balance central site loads.

The 8100s can communicate with each other or with the host CPU at

(Continued on Page 4)

Itel Adds Programmer Workstation

By Don Leavitt
CW Staff

NEW YORK — Taking a page from the book on data entry systems, Itel Corp. has introduced a remote program development system consisting of both hardware and software that appears to free DP professionals from the physical problems associated with coding work.

Developed by Softlab GmbH of Munich following a German government-funded study on the things needed to improve programmer productivity, the Maestro distributed programming system enables the programmer, as well as the systems analyst and program designer, to work at a CRT, an Itel spokesman said at a press conference here last week.

This eliminates reams of undisciplined design documentation, as well as all coding sheets and punched cards, most program listings and virtually all the handwritten notes that so typically are generated by project leaders and programmers alike, he explained.

Maestro is built around Four-Phase Systems, Inc. hardware and is said to support all phases of the program development cycle from problem definition and program planning through documentation and coding.

Control and evaluation of program compilation and testing on a mainframe — whether from IBM, Itel Corp., Univac, Siemens or some other vendor — linked to a Maestro processor are also components of the system, the spokesman added.

There is nothing within the Maestro logic to prevent its use with any programming language, except perhaps one such as APL, which has special characters.

Itel specifically noted that the system supports development of programs in Cobol, PL/I, Fortran or Algol, although compilation and testing are

(Continued on Page 6)

Britons Fearful of DP

By Rex Malik
Special to CW

LONDON — Two-thirds of Britain's employed labor force believes computers are more likely to put people out of work rather than create more jobs.

That is among the results of the first survey ever conducted on British attitudes about computers, work and employment. It was also the first nationally representative survey ever carried out in Europe on the employment consequences of computing.

The survey was made by National Opinion Polls Ltd. as a contribution to a wide-ranging discussion now going on in the UK on technology — particularly the microprocessor — and employment. This discussion has involved government, including the Prime Minister, the trade union congress, the government's "think tank" — the Central Policy Review Staff — and the media.

DP's employment consequences have been a subject of perennial interest since Norbert Wiener's *Cybernetics* was published in 1948. This round of discussion was sparked by a BBC "Horizon" program, a 50-minute film shown in April called "Now the Chips are Down."

(Continued on Page 8)

IN DEPTH
IN DEPTH

If you've been dividing by nine to see whether a transposition error has been made, Irwin Kraus has an enhanced method that he believes offers attractive time and labor savings. See 'Locating Transposition Errors' beginning on Page 13.

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Cincom 'Software of the '80s' Combines 'Total,' Inquiry and Retrieval Packages

By Don Leavitt
CW Staff

CINCINNATI – An enhanced and integrated, although apparently still modular, package of three current products was introduced last week by Cincom Systems, Inc. as "the software of the '80s."

The Total Information System (TIS) blends and extends the capabilities of the Total data base management system with the T-Ask inquiry facility and the Socrates batch-oriented retrieval package, which work with current versions of Total.

TIS also includes an interface to Cincom's Environ/1 teleprocessing monitor and to the user's choice of host languages for application programs, as does Total. But Total is not the central piece of TIS; a full-blown data directory – not just a data dictionary – drives the system, according to Cincom spokesmen.

The directory not only defines all the data elements in the system but does so many times over, providing a Finite Logical View (FLV) of the data available to each user. The term "subschema" was used synonymously with FLV as Cincom described this feature; it clearly is comparable to Codasyl's concept of the subschema.

'End-User Friendly'

The vendor characterized TIS as an end-user-friendly system, including both the DP novice and the professional programmer in the "end user" category. It was also described as a system that is machine-independent, even though TIS Release 1 – due in the second quarter 1979 – will be IBM 370-oriented.

In addition to data base management and communications management, linking to IBM's CICS and ultimately other monitors as well as Environ/1, TIS features both retrieval management – on-line and batch – and update management. FLVs can thus be maintained independent of data base structure or data location, according to Cincom.

The user-friendly nature of the TIS on-line query facility, "showing many of the characteristics of artificial intelligence," is illustrated, a spokesman claimed, by the "free-form natural language" instruction "Print Customer, Order and Quantity Times Cost if Zipcode is between 90000 and 99999 and When Finished Print Total and Average of Quantity Times Cost."

The system will prompt the user in the preparation of a request, questioning, for example, references to data outside the user's FLV or key words that are misspelled, the spokesman said.

Once completed, a request may be stored for subsequent reuse. Requests destined for such reuse may include parameters to be specified at runtime so reports can be customized without having to be re-created each time they are used, he continued.

Although the batch-oriented query facility was described as a subset of the on-line offering, it includes a sort facility that is not part of the interactive mode facility.

Both the on-line and batch query facilities include the means of equating a single word or phrase to a much longer or more complex phrase so requests may be shorter and less prone to the errors that might crop up as long expressions are retyped.

Task-Level Recovery

With its ability to support multiple concurrent users running in both on-line and batch mode, the data base management portion of TIS has been "heavily rewritten" to provide task-level recovery in case of problems on the system, the spokesman pointed out.

As long as a problem can be isolated to the logic handling a single task, it will be; other work can continue unimpeded by the problem, he said.

While TIS Release 1 will support only the network data structures supported over the years by Total, backing for other structures – hierarchies and inverted lists, for example – will "almost inevitably" be available as TIS evolves, another spokesman noted.

That makes TIS an alternative for users of other data base management systems who see its range of facilities as more attractive than what they are now using, he acknowledged.

Release 1 will include directory management, both batch and on-line; data base management with task-level recovery; and both on-line and batch retrieval management. The purchase price of the package is expected to range from $120,000 to $150,000, depending on the type of installation.

Most users would be expected to rent it, the company said, but declined to provide monthly rental prices.

For purposes of comparision, however, DOS Total/Logging sells for $43,000 and rents for $1,025/mo. OS Total/Logging sells for $54,000 and rents for $1,300/mo.

Cincom Systems is at 2300 Montana Ave., Cincinnati, Ohio 45211.

Correction

In *Computerworld*'s coverage of the Intergovernmental Conference on Strategies and Policies in Informatics (Spin) [CW, Sept. 4, 11] the term "informatics" appeared several times. Our attention has been called to the fact that "Informatics" is the registered trademark of Informatics, Inc. of Sherman Oaks, Calif. The trademark is used to identify the goods and services of that company.

On the Inside This Week

NEWS

Small Systems Bridge Gap in HP's Mid-Range 5
Team Approach May Cut Programmer Output 7
System Computes Odds for Workable Marriage ... 12
In Depth: Locating Transposition Errors 13-15
Citizen-Managed Utility Seen Avoiding '1984' 16
Nations Seen at Odds on Software Protection 17
Computerized Mail Seen Future Office Benefit 18
Models to Help Predict Global Climatic Change ... 20
Student Winner Reflects on Israeli DP Contest 21
Five-Day Course to Cover Structured Design 22
Conference to Examine Data Regulation Issues ... 23
Managers on the Move 26

EDITORIAL

Editorial: Zapped by the Zip 28
Human Connection: Terminal Training Wins 29
Taylor Report: Two Crimes Covered in One Day ... 29
Sociology of Computing: Time-Sharing 'Messiah' .. 29
What's in a Name – Or Even in a Number? 31

SOFTWARE & SERVICES

ADR Beefs Up Its 'Vollie' 33
Cobol Report Writer Practical in Most Uses 35
Corporate Tax System Provided on Remote Net ... 35
'In-School' System Speeds Grade Reporting 37
Documentation Requires Detail 38
Transaction Applications Backed 40

COMMUNICATIONS

Japanese Show Off Interuniversity Net........... 41
Graphics Terminal Features Refreshed Display.... 42
Portable Terminal/Scanner Works Over Phone ... 43
Telemetry Meeting Planned 44

SYSTEMS & PERIPHERALS

List Contains 'Musts' of OCR Selection........... 47
Sycor 400 Aimed at Low-Volume Data 48
College Increases Fortran Throughput 16-Fold 50
Order Entry System Spreads Benefits for User 52
Honeywell Users Planning Phoenix Forum......... 53
Add-on Helps Utility Boost Evening Throughput ... 54

MINIWORLD

Decstation Systems Gain Three Levels 55
CDC Expands Line, Cuts Prices of IBM Units...... 56
Irrigator Flows to Mainframe via Small System 57
Interdata 8/32 Gets Fortran VII 58
Board Gives GA Users Up to 64K of Memory...... 59

MICROCOMPUTING

Mobile Home Becomes Micro Showroom 61
Memory, I/O Peripherals Offered for MCS-85 82

COMPUTER INDUSTRY

HP Marks Mid-Range Turning Point............... 83
National Semi Planning PDP-11 Type Mini 63
Signetics Reorganizes Industry Sales Group 65
Memorex Sets Up Centers to Centralize R&D 67

Dr. JEKYLL

What do you do if your IBM sort starts turning into Mr. Hyde?

(Call us at the first sight of fangs!)

(201) 568-9700.

Get your act together with a SyncSort benchmark.

We think you'd better know that some OS/VS sort programs out there are leading *pretty colorful* double lives.

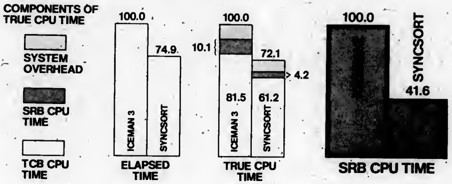
At first glance these Good Time Charlies look respectable enough. They're scions of that Grand Old Hardware Family. And under "normal conditions" — when did you last see any? —these programs look okay.

But then the data-processing climate changes. The sorting moon gets full, and the multi-programming jobs begin sending out their urgent messages on the jungle drums.

And the next thing you know your respectable sort program is out there committing atrocities — against your MVS resources and your non-sorting jobs in the mix.

What do you do if you think you've got a Jekyll/Hyde problem? Call us and we'll arrange a sorting survey. It's designed to tell you more about sorting — and your sort programs — than you ever knew.

The critical step is a benchmark that compares SyncSort's performance with that of your other sort(s). If you happen to be using the Computer Giant's 5740-SM1, Release 3, you'll see an eye-opening difference in resource utilization. On average it will look like this:



Incidentally, those charts on the right are particularly worth noting. They show the considerable difference in "locked-up" SRB Time between their sort and ours.

As you probably know, SRB Time is that component of True CPU Time when no messages can get through to the CPU. The more SRB Time in a sort, the greater the evil impact on other, non-sorting jobs in the mix.

It's a sure indicator of possible sort kinkiness. And the quickest way we know to spot Mr. Hyde in a crowd.

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IBM Unbundles Software

(Continued from Page 1)

minicomputer market.

The firm's Data Processing Division, which is marketing the 8100, previously offered certain parts of operating systems — such as the System Extensions to MVS — for a separate charge, but never an entire operating system.

IBM has also established a two-tiered licensing structure for the operating systems. There is a basic charge for the first use of an operating system or program product; if the same program is to be run on several processors, each subsequent use is eligible for the Distributed Systems Licensing Option (DSLO), which carries a lower monthly charge.

The DPPX — available for a license fee of $150/mo — provides the system's basic ability to perform network and stand-alone processing, including application program development in Cobol, Fortran and Assembler, IBM said.

For specific functions, DPPX works with a number of other IBM program products for the 8100, IBM said. The Data Base and Transaction Management System, for example, is similar to the Customer Information Control System/Virtual Storage (CICS/VS) used on 370s, IBM said, so local data bases can be created in accordance with central procedures.

The program manages transactions and data files in the system, IBM said, providing a number of users with simultaneous access to information.

The basic system costs $90/mo and the DSLO carries a tag of $68/mo.

The Host Command Facility runs on a 370 host when the 8100 is hooked up in a distributed network. It allows the central site staff to check, operate or program any 8100 in the network. The Host Command Facility is available on a basic license of $85/mo.

On the other side, a 3270 Data Stream Compatibility feature provides pass-through capability, permitting IBM 3270 and 8775 terminals attached to an 8100 to reach programs and applications in the 370 to which the 8100 is linked. It costs $15/mo for the basic package and $11/mo on DSLO.

The Development Management System is the program aid that translates English language statements into Cobol. This will allow people without DP backgrounds to create their own programs, IBM said. The basic charge is $85/mo and the DSLO is $64/mo.

In addition, DPPX/Cobol, DPPX/Fortran and DPPX/ASSM allow programs to be compiled and run in Cobol, Fortran and Assembler, respectively, IBM said.

The DPPX/Cobol compiler costs $80/mo for the basic unit and $60/mo under DSLO; the Cobol runtime library costs $15/mo and $11/mo respectively.

The Fortran Compiler carries a basic price tag of $60/mo and the DSLO is $45/mo, while its runtime library costs $30/mo and $23/mo, respectively. DPPX/ASSM costs $40/mo for the first copy and $30/mo for others.

Another feature — the Distributed Presentation Services package — allows users to tailor 3270 or 8775 CRT screen formats, IBM said. The feature comes in two parts; the Interactive Map Definition package costs $65/mo for the first 8100 and $49/mo for DSLO, and the Format Management package costs $25/mo and $19/mo under the pricing schemes.

RJE Capability

In order to let the 8100 act like a remote job entry (RJE) terminal, IBM is offering a program product called DPPX/RJE. This program rents for $20/mo for the first use and $15/mo for subsequent uses.

A sort/merge package for the system will cost $20/mo for the first use and $15/mo for use on other processors.

Furthermore, an Executive Performance Tool is available that permits users to monitor the performance of the 8100 processors and receive regular reports, IBM said. The monitor portion costs $35/mo and the reporter portion will run users $40/mo.

A parameter-driven table generation facility that allows 8100s to change, use and update programs and data bases in an organization's central data files is also available for $15/mo on the basio charge and for $11/mo under DSLO.

All of those program products work only with the DPPX, but in tightly controlled distributed networks users can use DPCX on the central 8100 or 370 site for a fee of $215/mo.

DPCX offers such users "improved processing speed" compared with present 3790-type installations, IBM said, as well as access to as much as 320M bytes of disk storage and the ability to use the IBM 8809 tape unit.

DPCX incorporates the functions of the 3790 system including the ability to be programmed from a central 370 site, IBM said, adding that all programs written for the 3790 will operate on a 8100 running DPCX.

On an 8100, DPCX permits the system to function as a remote batch terminal operated from the host system, performing batch printing and message exchange functions, IBM added.

The 8100 systems can be attached to host 370 processors operating under OS/VS1, OS/VS2 MVS or DOS/VS, IBM said.

First Use of 64K Chip

WHITE PLAINS, N.Y. — IBM's use of 64K-bit memory chips in the 8100 information system is believed to be the first system applications of such devices, industry sources indicated last week.

The maximum chip size used in presently available systems is 16K bits, they noted, even though some firms have announced plans to offer 32K devices.

The only announcement to date of complex chips containing 64K bits has been from Texas Instruments, Inc., which announced plans to develop and deliver such a chip next year. The TI chips, however, have not yet been incorporated in any systems and will initially be available for testing only.

The IBM announcement, therefore, is seen as a major jump in technology, particularly since IBM claimed to be "in production" of larger chips at its Burlington, Vt., and Sindelfingen, Germany, plants.

The chip is made by a new IBM process for forming reliable metal gates that register the presence or absence of information, IBM said.

That process involves n-channel, metal gate FET technology which uses silicon nitride to enhance gate reliability, IBM added.

Furthermore, a conductive field shield is used in the chips to control surface leakage, IBM said.

Our new Ch[illegible] 1210 zips along at [illegible] LPM's ...and has [illegible] best features of [illegible] 1200 LPM big brother.

We geared down the revs on our new Model 1210 — and we also geared down the price accordingly. Yet, we still gave it all the best features of its 1200 LPM Big Brother. The new Model 1210 has motorized upper and lower tractor positioning, heavy-duty ChainTrain reliability, and it's completely microprocessor controlled.

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Two IBM 8100 CPUs Debut

(Continued from Page 1)

speeds up to 56k bit/sec, IBM said.

The 8100 family features two processors — the 8130 and 8140, built-in disk storage, built-in communications capabilities, a new CRT terminal — the 8775 — and an electronic reel-to-reel tape unit, as well as two new printers.

The 8130 processor uses the 64K-bit memory chip technology developed by IBM and has an internal operating speed of 1,500 nsec. Processor storage ranges from 256K to 512K bytes in 256K-byte increments.

The 8140 processor uses older memory technology for an operating speed of 800 nsec; its storage ranges from 256K to 512K bytes in 128K-byte increments.

Both processors feature a 1M-byte diskette unit and can also handle a 256K-byte diskette for supplementary storage. Each comes with 64M bytes of built-in disk storage which features an access time of 27 msec and a data transfer rate of 1,031 byte/sec.

An 8130 processor with a 512K memory, 1M-byte diskette and a 64M-byte disk will sell for $29,940 and rent for $917/mo on a straight rental plan or as little as $780/mo on a two-year lease plan that was announced with the system. Memory is priced at $4,500 for a 256K-byte increment.

The 8140 processor with the same amount of main memory, diskette and disk storage will sell for $46,980, rent for $1,786/mo and lease for $1,520/mo on the two-year plan. Its memory is available at a price of $6,240 for an increment of 128K bytes.

An additional storage and communications unit, the 8101, can be used with the system to boost disk storage up to 320M bytes. Up to four of these units can reportedly be used with the 8140 — two with the 8130 — to accommodate additional CRTs, printers or magnetic tape units.

The 8101 with 64M bytes of storage will sell for $16,410, rent for $524/mo and lease for $446/mo.

All of the units will be delivered in the third quarter of 1979, IBM said.

The 8775 CRT terminal announced with the system uses a new IBM-developed 18K memory chip and features a tilted antireflective screen. It can display up to 3,440 characters, and the screen can be partitioned into eight separate work or display areas.

(Continued on Page 6)

First Commercial Use of SOS

Small Systems Bridge Gap in HP's Mid-Range

By Jeffry Beeler
CW Staff

NEW YORK — A wide gap in the middle of the Hewlett-Packard Co. business systems line was bridged last week when that minicomputer manufacturer announced two small systems that provide compressed packaging densities through what is said to be the first commercial application of silicon-on-sapphire (SOS) technology.

Designated the models 300 and 3000 Series 33, the two systems form a middle-of-the-line bridge between HP's low-end Model 250 system and its high-end Model 3000 Series III, formerly the only two members of its business systems family. With the latest additions to its product line, HP for the first time offers an unbroken series of small business systems ranging in price from $24,500 to about $250,000, according to a company spokesman. (See related story on Page 63.)

As part of the same product announcement, the firm also introduced the first two members of its 2620 series of character-mode CRT terminals — the 2621P, which provides an integral 120 char./sec thermal printer, and the 2621A, which lacks a hard-copy output capability.

HP sources credited the use of SOS technology with squeezing the capabilities of nine 3000 series processor boards occupying 700 sq in. into three chips totaling less than 1 sq in. The resulting compression allows the company to fit the 3000 Series 33 into a desk-sized space and to configure the 300 in a cabinet not much larger than a stand-alone terminal, the sources said.

SOS technology also reportedly permits the two systems to rival the performance of TTL-based equipment and to cut their power dissipation to 1W compared with 3W to 5W for hardware incorporating standard N-channel MOS technology.

Both the 300 and 3000 Series 33 use the same processor, which offers a 270-nsec machine cycle and a 500-nsec memory cycle, the spokesmen explained. The former system's CPU, however, is microprogrammed to implement HP's virtual memory Amigo 300 operating system, while the latter system is microcoded to implement MPE III, the same multiprogramming executive operating system used with the firm's 3000 Series II and III systems.

HP spokesmen characterized the Series 33 as the LSI version of the company's 3000 product line and said the system provides half the processing power of the top-of-the-line Series III.

In System/34's Class

Positioned in roughly the same product class as the IBM System/34, the Series 33 supports a minimum of 256K bytes of error-correcting memory expandable to 1M byte — the same main memory capacity as the 300, HP sources said.

Both systems support any member of HP's 2640 terminal series as well as either version of the recently introduced 2621. The 300 accommodates up to 16 of these terminals, while the Series 33 supports up to 32, with a practical limit of 15 to 20, the company officials noted.

A basic HP 300 and Series 33 configuration incorporates a 12M-byte and 20M-byte disk unit, respectively, as well as a 1M-byte floppy disk unit. Optional mass storage models available with both systems include the 20M-byte HP 7906, 50M-byte HP 7920 and 120M-byte HP 7925 removable-pack disk units.

The HP 300 accommodates any two of these disk options for a total mass storage capacity of 260M bytes, while the Series 33 supports up to eight 7925s for a maximum capacity of 960M bytes.

In addition, the Series 33 operates with HP's 1,600 bit/in. 7970E tape unit.

Typical applications for the Series 33 include order entry, inventory-status checking and materials planning, while the HP 300 typically serves either as a dedicated control station in the inventory control and payroll departments of large companies or as the central business system in small firms, an HP official explained.

Although both systems accommodate Basic and RPG-II, the Series 33 also supports Cobol, Fortran and SPL. Other software features available with the latest HP 3000 member include the Image/3000 data base management system and the View/3000 data entry package.

The HP 300, meanwhile, provides software tools like the Image/300 data base management system and development aids like text editor, sort/merge and Help.

Among the HP 300's other hardware features is an integrated CRT screen with up to 32 display windows, each of which can attach to a data file and scroll horizontally or vertically to accommodate entries or changes, the spokesman said. One window labels a column of eight software keys that allow users to select operating system functions or application menus.

Although neither the HP 300 nor the 3000 Series 33 at present provide synchronous communications capabilities

(*Continued on Page 6*)

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IBM 8100 Makes Debut

(Continued from Page 4)

The 8775 with a 2,560-char. screen costs $3,645 and rents for $95/mo or $81/mo on a two year lease plan.

The 8809 tape unit does away with vacuum columns to maintain tape tension, using electronic sensors which constantly monitor and adjust the tension of the tape. The unit features 1,600 bit/in. recording for compatibility with other IBM tape systems, the firm said, adding that data transfer rates on the unit range from 20K to 160K byte/sec.

This unit will sell for $10,440 and rent for $341/mo or $290/mo on a two-year lease.

The printers for the system are the 3289 Model 3, which can produce up to 400 line/min and the 3287, which comes in 90- and 120 char./sec models.

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HP Adds Mid-Range Units

(Continued from Page 5)

like networking, remote job entry or multipoint terminal support, HP plans to add these features to both systems in the coming months, the spokesmen said. The 300 and Series 33 also currently lack a library of applications software as well as upward hardware expandability with the other members of HP's business sytems line, the spokesmen conceded.

Turning their attention to the two members of HP's 2620 terminal series, the sources credited the 4K-byte units with storing 48 lines and using a 9 by 15 dot matrix cell to display up to 24 lines with as many as 80 char./line. Both the 2621A and 2621P incorporate 12-in. diagonal displays, provide 128 Ascii character sets and transmit 110 bit/sec to 2,400 bit/sec.

A basic HP 300 configuration consisting of a 256K-byte CPU, 1M-byte floppy disk unit, 12M-byte fixed disk unit, one language and an integrated display costs $36,500. A minimum 3000 Series 33 with a 256K-byte processor, 1M-byte floppy disk unit, 20M-byte fixed system disk unit, system/-maintenance console and desk enclosure costs $70,000.

The 2621A and 2621P, meanwhile, sell for $1,450 and $2,550, respectively. Deliveries of the HP 300 will begin in 14 weeks; shipments of the 3000 Series 33, in January; and deliveries of the two character-mode terminals, in eight weeks.

HP is located at 1501 Page Mill Road, Palo Alto, Calif. 94304.

Programming Work Aided

(Continued from Page 1)

"obviously" dependent on the availability of those languages on the user's mainframe.

Unlike some of the terminal-based or communications-oriented systems already on the U.S. market, Maestro utilizes its processor's disk storage and local intelligence to support most of the facilities needed by programmers.

Nassi-Schneiderman Charts

The version-by-version archiving of programs for review or quick reinstatement has been matched by other systems, but Maestro's support for the generation of Nassi-Schneiderman charts, to make sure the program designs are complete and logical, appears to be a breakthrough.

An "electronic paper clip" or mark enables a programmer to identify lines of code to which he wants to return and an associated function key allows him to move from mark to mark, forward or backward, as he reviews or reworks the code, the spokesman added.

Reflecting the common practice of programmers working on several problems concurrently, Maestro provides each user with up to nine "bins" of disk storage, each of which can be brought to the CRT screen on command so that work can begin again right where it left off.

He also noted that portions of code or documentation developed by one Maestro user can be copied into another user's program, if appropriate, to avoid "reinventing the wheel." Beyond that, Maestro supports an electronic messaging system so that project leaders and programmers can immediately share ideas or news of specification changes.

To avoid the needless repetition of commonly used coding — the Environment Division in a Cobol program, for example — Maestro provides a procedure language under which code and function key use can be defined once, then invoked any time it is required, by keying in its name and any runtime parameters, he continued.

Maestro enables the user to scroll up and down through work-in-progress and, when something of interest appears, to scroll sideways as well in order to see all of a 132-column listing, for example, even though the CRT screen normally accommodates only 80 characters horizontally.

The remote job entry implementation of Maestro is expected to be ready for delivery to U.S. users by the end of the month. A version supporting interactive compilations and testing under IBM's CMS or TSO "should be ready in the second quarter of 1979," the spokesman estimated.

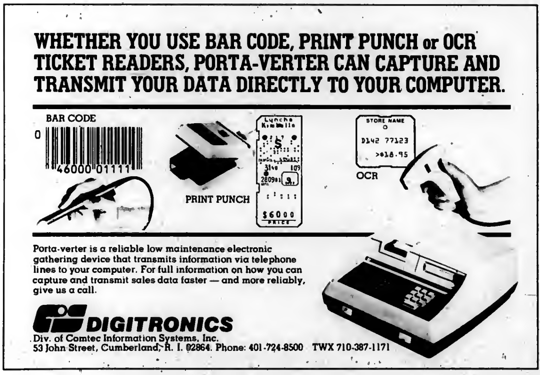
The minimum Maestro configuration will include a processor, disk subsystem, line printer, tape drive and four terminals. It will cost $188,000 and will be expandable at $3,000/terminal until it reaches its current maximum of 10 terminals per processor for $206,000.

That maximum will be increased to 20 terminals per processor by mid-1979, the spokesman added.

The data communications unit supports synchronous transmissions to and from the the host CPU at rates ranging from 1,200- to 9,600 bit/sec, he said.

Itel will be responsible for both hardware and software support so users need make only one call in case of a question or a problem, he noted.

Itel is at One Embarcadero Center, San Francisco, Calif. 94111.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Professors' Study Indicates

Team Approach May Cut Programmer Output

By Nancy French
CW Staff

The chief programmer team concept, which fragments the tasks involved in systems analysis and programming and forces greater social interaction among those working on a project, could actually reduce rather than increase productivity.

The reason: both fragmentation and forced interaction work against the aspects of DP jobs that satisfy and motivate DP professionals.

This is one of the implications of a study by Daniel Couger, professor of computer and management science at the University of Colorado's College of Business, and Robert A. Zawacki, an associate professor of management and organizational behavior at the university.

The study, which Couger described briefly at this year's National Computer Conference [CW, June 13] was published in part in the September issue of *Datamation* magazine.

According to Couger and Zawacki's findings, DP professionals rate their need for social interaction lower than do other professionals and show a greater need for "personal growth" — or learning or developing beyond their current level. With these general characteristics, they "are not actively seeking a 'team experience" and in most cases would rather work alone or work with others only for short periods of time.

Relatively Satisfied

The study also found that DP professionals in general rank their jobs as relatively satisfying. This is because the highly motivating atmosphere in the DP environment dovetails nicely with the DP professionals' unusually high need for personal growth. The classical descriptions of programming and systems analyst positions, then, are "a good match" for the individuals who fill them, the study found.

But what about the chief programmer team concept? Will it reduce job satisfaction and productivity?

This approach resembles the efforts of "the industrial engineers of the 1940s who kept chipping away at each job on the auto assembly line until it was splintered into the ultimate level of specialization.

"We seem to be concentrating just as fervently on fragmenting the jobs of analysis and programming," and to achieve greater productivity and hence greater job satisfaction, such jobs "should be enlarged in scope rather than reduced," the authors said.

"If we devote equal time to the analysis of motivation and the ingredients of job satisfaction, this alone may increase productivity," the suggested.

What does this mean to the DP manager who has already implemented team approaches to programming?

The team approach will work, the authors said, if the "frequency" and duration of team meetings are controlled. They recommended, for example, that structured walkthroughs be limited to two hours.

Feedback Lacking

"There is one area of human interaction, however, that DP professionals did not get enough of, according to the study, and that was supervisory feedback. This may be because their supervisors were once programmers and systems analysts themselves with "low social need." Perhaps these supervisors and managers should be getting additional training in supervisory techniques and working with people when they are promoted, the article suggested.

The study was based on a survey of 1,600 people in DP jobs, 600 of whom were programmers or analysts.

The researchers used a behaviorists' model developed by Greg R. Oldham of the University of Illinois and J. Richard Hackman of Yale University. This model has been used to collect data on other professionals, and its use allowed the two authors to compare the results to some kind of a norm, the article said.

The model identified five important job characteristics, or "core job dimensions." These included skill variety, task identity, task significance, autonomy and feedback. Skill variety, task identity and task significance lead to the first of three critical psychological states described as "experienced responsibility for outcomes of the work"; and feedback leads to "knowledge of the actual results of the work activities."

These psychological states are associated with "high internal work motivation," "high-quality work performance," "high satisfaction with the work" and "low absenteeism and turnover," the article said.

DP employees seem to experience the same level of meaningfulness in their jobs as other professionals do, but have "lower perceptions of the degree of responsibility and knowledge of results," the authors found. Specifically, all professionals, including DPers, said they get most of their feedback from their jobs themselves and scored this element around five on a scale of one to seven. However, DP professionals scored feedback from supervisors at 3.97, compared with 4.21 for other professionals.

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Britons Believe DP Means Unemployment

(Continued from Page 1)

The film argued that the microprocessor will destroy employment as it is now known and that without substantial change, the UK could by the middle 1980s face unemployment three to four times higher than the 6% of today.

The results of the survey on computers and employment was presented to a UK press symposium organized by Univac at its international executive center at St. Paul de Vence, just outside Nice in Southern France. The symposium was attended by, among others, Michael Spicer, Conservative member of Parliament and a key figure in the opposition's development of policy for the industry, and by Reay Atkinson, formerly director of the UK goverment's Central Computer Agency which purchases and runs the government's DP power. Atkinson is now in charge of Computing and Microelectronic's support policies.

The survey, carried out with a nationally representative sample of 1,001 people in employment, showed that 25% expected computers to put "lots" of people out of work and 41% think they will put "some" people out of work.

The breakdown according to type of employment showed fears of computing are at their highest among the unskilled. For instance, where 16% of those in management expect computers to put "lots" of people out of work, 35% of unskilled workers expect the same consequence.

Only 16% of the sample — broken down into managerial, other white-collar, skilled and unskilled — expect computers to create more jobs. All groups indicated that even if computing were to create more employment, this would not be much more. "Create many more jobs" received percentage answers ranging between 2% and 4%, with an average of 3%.

However, when asked "Should we have more or fewer computers?", more people replied "Yes, we should have more" than those whoe wanted "fewer," by a score of 39% to 38%. Twenty-three percent replied they didn't know.

The questions for the survey conducted by National Opinion Polls Ltd. were developed by journalist Rex Malik.

Again there was a marked difference between the classes: 56% of managers said "more" while 17% said "fewer." Among unskilled workers, 24% said "more" and 48% said "fewer."

Here there was also a noticeable difference between the sexes, with 46% of men saying "more" and 36% "fewer" as opposed to 28% of women saying "more" and 43% saying "fewer."

Rampant Puritan Ethic

If the mix of technologies threatens employment as we now have it — the premise the symposium set out to discuss — then the UK's working population faces some severe challenges to its attiudes. The survey showed the Puritan ethic runs rampant in the UK, contrary to the attitudes many foreigners have of Britain's working population.

To the question "Do you enjoy the work you do a lot, a little or not at all?", 75% replied they enjoy it "a lot." The range was highest in the management group where 81% said they enjoy work a lot, and still at a remarkable high 66% among unskilled workers.

Only 1% of managers liked what they are doing "not all all," and that figure rose only to 8% among the unskilled.

Job satisfaction, however, was highest among other white-collar workers, with 83% liking their work "a lot." In view of the general expectation in the UK — expressed at conference after conference during the last year or two — that technology is now going to start biting into employment prospects in the office, the white-collar field, this does not auger well for the future of labor relations.

When respondents were asked "If you had the opportunity to give up work without loss of pay, would you do so?", 56% said "no" while 40% said "yes" — across all classes.

The subject was then presented another way. "If you could be paid the same for doing another job, would you want to continue the job you do, or would you like to do something else?" Here 65% said they would continue, while 33% would get other work, with a high of 40% among 15 to 24 year olds.

Retraining With Pay

Those surveyed were also asked, "Would you like to be retrained for another job (the retraining would be paid and you would not lose any money)?" Fifteen percent said they would like very much to be retrained, and 21% said they would "quite like" it.

However, 61% stated they would either "not like at all" or 'not really like" retraining even without any loss of money.

Nevertheless, as National Opinion Polls calculated from current national labor statistics, if one adds the two groups in favor, 7.5 million people would accept retraining provided they suffered no financial loss.

The British, it seems, are prepared to change their work habits in enough numbers to cushion the shock of change, if the financial conditions for their not fighting it can be created. As the survey showed, however, unemployment is the great British preoccupation.

To the question "Do you think the figure of 1.5 million unemployed is acceptable in our economic circumstances?", they came out 5-1 against its acceptability. The actual questions were "acceptable in our economic circumstances" or "unacceptable in any circumstances," 76% took the latter view.

Crux of Argument

At the heart of the argument over the impact of computers on employment has been the view that one either believes or does not believe that people are going to be an essential element within the conventional economy. If jobs cannot be found, then a means of income distribution must be found and the leisure society encouraged.

But do people want to leave work? "If you had the opportunity to give up work without loss of pay, would you do so?" was also asked; 40% said yes, 56% said no.

The no figures — a shock for those who believe the younger generation has lost the will to work — were at their highest among those 15 to 24 years old.

However, the notion of a society in which people could choose whether to work got short shrift. To the question "Do you think it would be a good thing for society if people didn't have to work to get money, but could choose to work or not?", the no's had it, 83% to 12%.

Nearly twice as many women said yes as did men — 16% to 9%.

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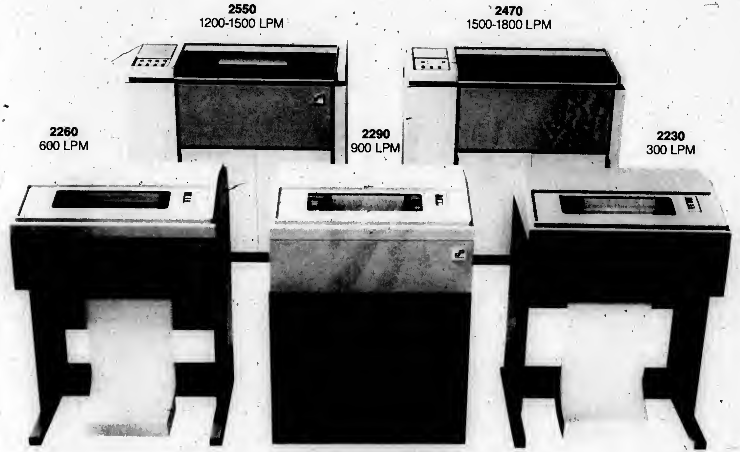

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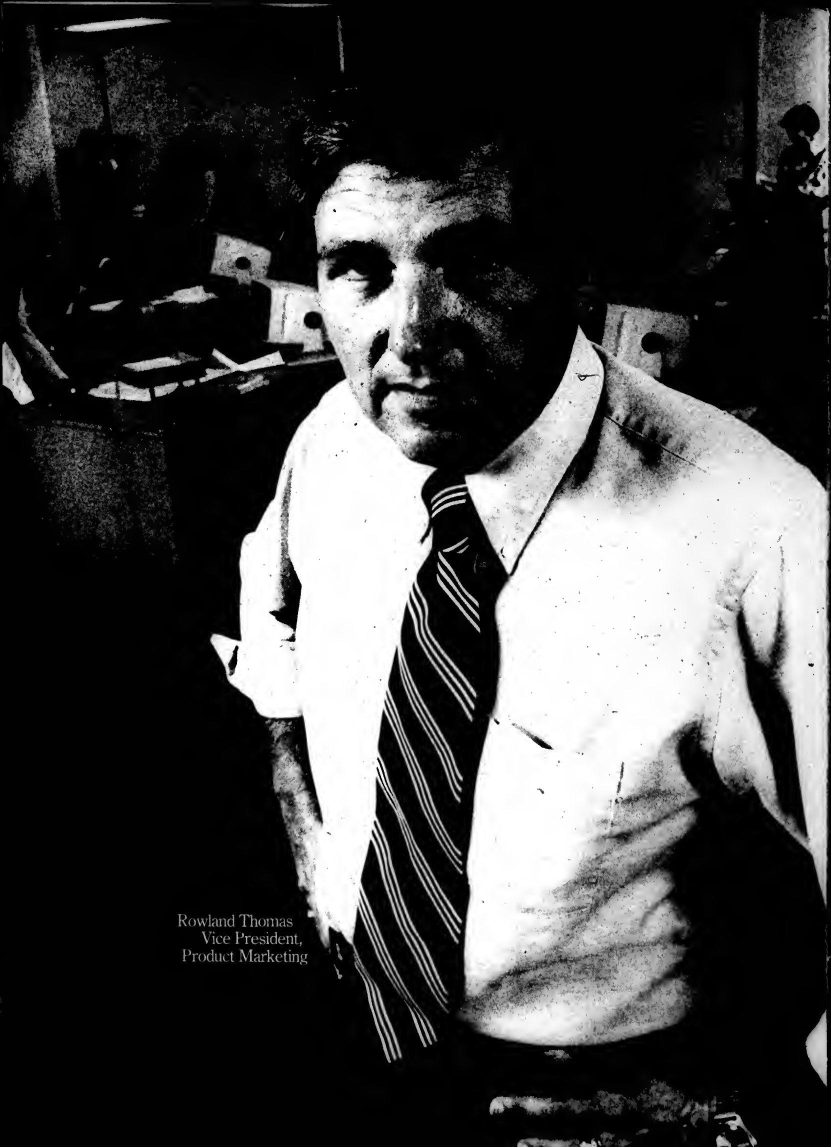

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System Computes Odds for Workable Marriage

By Ann Dooley
CW Staff

SALT LAKE CITY, Utah — Choosing a marriage partner is a decision that is rarely made rationally or logically, according to two sociology professors who developed a marriage analysis simulation system that puts a note of cold, hard logic into romance.

Called Matesim, the computer simulation is designed to help people analyze marriage decisions and values. Using Matesim, an individual can describe an ideal mate in terms of personal values and determine how closely one's intended measures up to that ideal, according to professors Gerald Smith and Jerry Debenham.

The simulation took nearly three years to develop and includes 108 categories for analyzing marriage. The system is programmed to ask the respondent a series of questions about his marital values and expectations, his general value system and his prospective partner's values.

Run on a Univac 1108, the simulation performs an analysis for each potential partner, notes the person's strengths and weaknesses, makes a prediction of the marriage's success, points out potential trouble spots resulting from divergent values and also notes how the respondent would have to change to improve the success potential, Smith explained.

The simulation records the respondent's marriage values and compares them with a set of idealized values that marriage counselors have determined lead to a successful marriage.

The professors have implemented the Matesim analysis in their classes at the University of Utah to show students how to think rationally about marriage and also to "turn them on to computers," according to Smith. As many as 100 males and 100 females can simultaneously indicate their values and their marriage expectations by using Digital Equipment Corp. Decwriter terminals located at the University.

Trying Out Marriage

Students can simulate marriage to classmates or to specific beaux to find out if a marriage might prove successful.

To describe themselves and what they want in a mate, the students choose from more than 1,000 different judgments in categories such as physical characteristics, personal habits, work and economic orientations, family expectations, mental orientations, sexuality, personality characteristics, personal preferences and social characteristics.

Questions about individual values cover physical attractiveness, television viewing habits, job mobility, child discipline, goals, ambitions, attitudes toward life, class association and self-confidence.

The system is programmed in APL and has a capacity of 250,000 bytes, according to Smith, who also noted that the program runs entirely in English and requires no user knowledge of computer languages.

The simulation is composed of more than 2,000 programming steps and — it is such a large program — APL is almost too small, Smith pointed out.

Once the candidate and the respondent's value information has been entered, the system compares and contrasts the two responses and also compares them to the marriage counselors' information. This source consists of the collective opinion of social workers and psychologists who looked at all the values from a professional viewpoint and decided what values were important to marriage.

The system also compares how a candidate differs from the respondent's ideal by determining the candidate's traits in each category and then subtracting the value the candidate assigned to the trait from the value the respondent assigned to the trait. The resulting number indicates how close the candidate is to the respondent's ideal mate in terms of values.

Similiarties and differences between value systems can also be compared by the system. It can indicate how the respondent should change priorities to experiment with alternative value orientations, Smith explained.

In addition, the system points to the most fulfilling and the most troublesome areas to expect in the marriage according to similarities' and differences in hgih priority values.

Three Major Factors

The simulation results are derived from three major factors: values considered important in a marriage by counselors' standards, proximity of the partner to the respondent's ideal and closeness of the partner to the respondent's values. If the couple is in conflict in 50% of the areas, the marriage would not be determined successful, according to Smith.

Debenham and Smith have distributed the simulation program to several universities and nonprofit institutions while acting as consultants to the project.

In order for social and behavioral scientists to use the simulation concept, change routines were built into the program for modification to fit the user's needs.

Brigham Young University, for example, changed many of the questions relating to sexual values to questions about spiritual values since that institution felt the latter were more significant to its students, Smith noted.

Such changes can be implemented on an interactive computer terminal, he pointed out.

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Locating Transposition Erorrs

By Irwin Kraus

Tranposition errors, the interchange of two adjacent digits when transcribing a number, have been the bane of accountants, clerks and statisticians. A common method for detecting transposition errors has traditionally been taught in basic accounting courses. The method states that if a column of figures is out of balance and the amount of the error is evenly divisible by nine, one of the figures has probably suffered transposition.

At this point each figure must be verified, a process which is complicated by the mind's perverse tendency to perceive the incorrect figure as it should be and not as it is.

Mathematical analysis of the basic accountant's method has yielded some relationships which provide additional information about the figure containing the transposition error. The enhanced method identifies a subset of candidate figures, one of which will contain the error.

As will be shown, the subset comprises approximately 5.5% of the figure population, thereby drastically reducing the time required to locate and correct the error. Due to Murphy's Law, these errors most frequently occur under the severe time constraints of financial closings or quickly approaching project deadlines. Hence, the time and labor saving qualities of the enhanced method become quite attractive.

The method can be used manually, but is particularly suitable for computerization. A typical application would be a batch of transactions accompanied by a batch header containing a control total. If the amounts in the transactions do not balance to the control total and the difference is evenly divisible by nine, the transactions may be listed with the transposition error candidates flagged. From a population of 1,000 transactions, only about 5.5% or 55, would have to be examined.

The information provided by the enhanced method which permits error candidates to be recognized is:

- The position of the transposed digits within the figure.
- The arithmetic difference between the two transposed digits.

The arithmetic difference will range from -1 to -9 and 1 to 9. If the difference is zero, the digits are identical and the transposition has no effect. By locating which two-digit positions should be inspected and knowing the arithmetic difference of those two digits, the search for the error is considerably narrowed.

Control Total	Figures
$3,738.55	$ 651.32
	171.95
	18.28
	937.62
	1,952.18
	$3,731.35

Figure 1

Figures	Third - Second Digit
65132	1 - 3 = -2
17195	1 - 9 = -8
1828	8 - 2 = 6
93762	7 - 6 = 1
195218	2 - 1 = 1

Figure 2

An example at this point should clarify the process. First, the groundrules:

1. Digit positions will be counted from right to left.
2. Decimal points will be ignored. Treat the figures, totals and differences as whole numbers.

Given the control total and column of numbers shown in Figure 1, the method will be used to locate and correct a transposition error.

Step No. 1

Using the basic accountant's method, determine if the out-of-balance condition may be a transposition error. If the difference between the two totals is evenly divisible by nine, transposition is probably the culprit.

This may be stated:

$$(\text{Figure Total}) - (\text{Control Total}) = 9k$$

where k is a whole number.

$$373135 - 373855 = 9k$$
$$-720 = 9k$$
$$-80 = k$$

Since k is a whole number, transposition is indicated and the procedure may continue.

Step No. 2

The value of k bears a clue as to which digit positions were transposed. This is based on the fact that any number may be represented as the sum of a series, such as:

$$9{,}238 = 9 \times 10^3 + 2 \times 10^3 + 3 \times 10^1 + 8 \times 10^0$$

If k is converted to this notation, it will be:

$$-80 = -8 \times 10^1$$

This signifies that the transposition error begins in the 10^1, or second, digit position. The other digit taking part in the transposition will be the next to the left: the 10^2, or third, position.

Step No. 3

Having located the digit positions in question, the digit difference must now be determined. The value of k also yields this: it is simply the mantissa portion of k as expressed in scientific notation, or -8. The column of figures may now be scanned for one whose third less second digit equals a negative 8. (See Figure 2).

The second figure, $171.95, fits the criteria. (Correct the transposition to $179.15 and see if the control and figure totals balance.) In a larger population of figures, other digit combinations may have also

(Continued on Page 14)

IN DEPTH

IN DEPTH

LOCATING TRANSPOSITION ERRORS

```
                 COBOL EXAMPLE - TRANSPOSITION ISOLATION

WORKING-STORAGE SECTION.

01   BATCH-HEADER-RECORD.
     05   CONTROL-TOTAL                                  PIC S9(7)V99.
     05   FILLER...
01   TRAN-RECORD.
     05   MISCELLANEOUS-TRAN-DATA...
     05   DETAIL-FIGURE                                  PIC S9(5)V99.
01   WORK-AREAS.
     05   DETAIL-TOTAL                                   PIC S9(7)V99.
     05   ERROR-AMOUNT                                   PIC S9(7)V99.
     05   REMOVE-DETAIL-SIGN                             PIC S9(5)V99.
     05   DIGIT-BREAKDOWN REDEFINES
               REMOVE-DETAIL-SIGN.
          10 DIGIT OCCURS 7 TIMES PIC S9.
     05   K                                              PIC S9(7).
     05   X-POS                                          PIC S9.
     05   Y-POS                                          PIC S9.
     05   END-OF-FILE                                    PIC XXX.
     05   TRANSPO-ERROR                                  PIC S9(7).
     05   DIGIT-DIFFERENCE                               PIC S9.

PROCEDURE DIVISION.

     Housekeeping

PROCESS-TRAN.

     Normal transaction processing

     ADD DETAIL-FIGURE TO DETAIL-TOTAL.
     •
     •
     •
END-OF-JOB.
     SUBTRACT CONTROL-TOTAL FROM DETAIL-TOTAL
          GIVING ERROR-AMOUNT.
     IF ERROR-AMOUNT NOT = ZERO
          DIVIDE ERROR-AMOUNT BY 9
               GIVING K, REMAINDER TRANSPO-ERROR
          IF TRANSPO-ERROR = ZERO
               PERFORM TRANSPOSITION-ERROR
          ELSE
               DISPLAY 'OUT OF BALANCE, NOT TRANSPO.'.
TRANSPOSITION-ERROR.
     CLOSE TRAN-FILE.
     OPEN INPUT TRAN-FILE.
     NOTE - CALCULATE Y DIGIT POSITION.
     PERFORM DIVIDE-K
          VARYING Y-POS FROM 1 BY 1
               UNTIL K IS LESS THAN 10.
     NOTE - CALCULATE X DIGIT POSITION.
     ADD 1, Y-POS GIVING X-POS.
     NOTE - AT THIS POINT, K IS EOUAL TO THE
          DIGIT DIFFERENCE BEING SOUGHT.
     PERFORM PASS-TRAN-FILE
          UNTIL END-OF-FILE = 'YES'.

PASS-TRAN-FILE.
     READ TRAN-FILE INTO TRAN-RECORD
          AT END MOVE 'YES' TO END-OF-FILE.
     IF END-OF-FILE NOT = 'YES'
          MOVE DETAIL-FIGURE TO REMOVE-DETAIL-SIGN
          SUBTRACT DIGIT (Y-POS) FROM DIGIT (X-POS)
               GIVING DIGIT-DIFFERENCE
          IF DIGIT-DIFFERENCE = K
               DISPLAY TRAN-RECORD, 'POSSIBLE TRANSP. ERROR'
          ELSE
               DISPLAY TRAN-RECORD.

DIVIDE-K.
     DIVIDE K BY 10.
```

Figure 3

(Continued from Page 13)

yielded a negative 8, but the search for the error will have been narrowed to a relatively small subset of figures.

A short excursion into the realm of probability will explain why the method identifies a subset of error candidates averaging 5.5% of the figure population.

Of the transposed digits, the first may range from 0 to 9, giving 10 states. The second may also range from 0 to 9, but if it is equal to the first, transposition would have no effect. The second digit, therefore, has nine states which, combined with the 10 states of the first, result in 90 possible digit combinations.

The arithmetic difference between the two digits ranges from -1 to -9 and 1 to 9, 18 possible values. Each value can be found in only a certain number of ways. For example, there are only three digit combinations which yield a difference of -7:

0 — 7
1 — 8
2 — 9

The number of ways that digit differences may be found range from one (for -9 and 9) to nine (for -1 and 1). The total of these possibilities is 90 different ways in which the 18 digit differences may be found. The average number of ways is, therefore, five (90/18).

Since any of the 18 differences from a transposition error have an equal probability of occurring, the probability of finding a figure which contains two digits yielding a specific difference is the average number of ways that a difference may be obtained divided by the total number of digit combinations:

5/90 = .055555

This means, that, on the average,

Irwin Kraus has been senior DP auditor at Blue Cross/Blue Shield of Kansas City, Mo., for about six months. Prior to that he was a programmer/-analyst.

Kraus, who is working on a bachelor's degree in finance, became a programmer when he joined the Marine Corps in October 1968.

5.5% of all figures will contain a digit combination which yields a specified difference.

A sample Cobol implementation of the method is shown in Figure 3. The position of the two transposed digits will be referred to as X and Y, respectively, X being the leftmost. The digit difference will be found by subtracting the Y digit from the X digit.

It should be noted that k could be simply converted to scientific notation, the mantissa yielding the digit difference and the exponent indicating the position. This example will, however, divide k repeatedly by 10 until k is less than 10. The number of divides required will be equal to the exponent and the residual k value will equal the mantissa had k been expressed in scientific notation.

For example, if k = 5,000, three divides are required before k is less than 10:

$$5000/10 = 500$$
$$500/10 = 50$$
$$50/10 = 5$$

The residual k value and the three divides signify that

$$5000 = 5 \times 10^3$$

When a transposition error has been made, the following statement is true:

(Erroneous Figure) - (Correct Figure) = 9k

Letting x and y represent the transposed digits at some position 10^{n+1} and 10n within the figure, this may be restated

$$(x10^{n+1} + y10^{n}) - (y10^{n+1} + x10^{n}) = 9k \quad (1)$$

Simplifying:

$$(x10^{n+1} + x10^{n}) - (y10^{n+1} + y10^{n}) = 9k \quad (2)$$
$$x10^{n}(10-1) - y10^{n}(10-1) = 9k \quad (3)$$
$$9x10^{n} - 9y10^{n} = 9k \quad (4)$$
$$10^{n}(x-y) = k \quad (5)$$
$$x-y = \frac{k}{10^{n}} \quad (6)$$

This last expression allows the digit difference (x-y) to be found. The power of 10 required to make the statement true specifies the position of the transposed digits. That power of 10 may be obtained intuitively.

However, it may also be found by restating the expression:

$$10^{n} = \frac{k}{x-y} \quad (7)$$
$$n = \log^{10} \frac{k}{x-y} \quad (6)$$

Although this method requires the simultaneous solution of x-y and n, the procedure is simplified by the fact that if k were expressed in scientific notation, the mantissa is equal to x-y and the exponent is equal to n.

Lecht to Speak At Datapro Meet

DELRAN, N.J. — Charles P. Lecht, chairman and president of Advanced Computer Techniques Corp., will be the featured speaker at a series of workshops sponsored by Datapro Research Corp. on Nov. 30 at the Americana Hotel in New York.

Lecht will talk about white- and blue-collar information processing symbiosis on the third day of Datapro's national conference on "Information Technology and the Office." The conference begins Nov. 28.

The speaker is author of *The Waves of Change; A Techno-Economic Analysis of the Data Processing Industry,* which was serialized in the pages of *Computerworld*.

Other Speakers

Other speakers will include Robert V. Head, assistant for ADP Technology for the U.S. Department of Agriculture; Dr. Robert M. Landau, president, Science Information Association: Amy D. Wohl, word processing editor for Datapro Research Corp.; Frank R. Heath, vice-president of management systems for Crouse-Hinds Co.; and Dr. William J. Wenker, chief of the WWMCCS Computer Performance Evaluation Office in the Department of Defense.

Registration costs $440 for Datapro subscribers and $485 for nonsubscribers before Oct. 28 and $490 and $540, respectively, after that date.

Additional information is available from Datapro at 1805 Underwood Blvd., Delran, N.J. 08075

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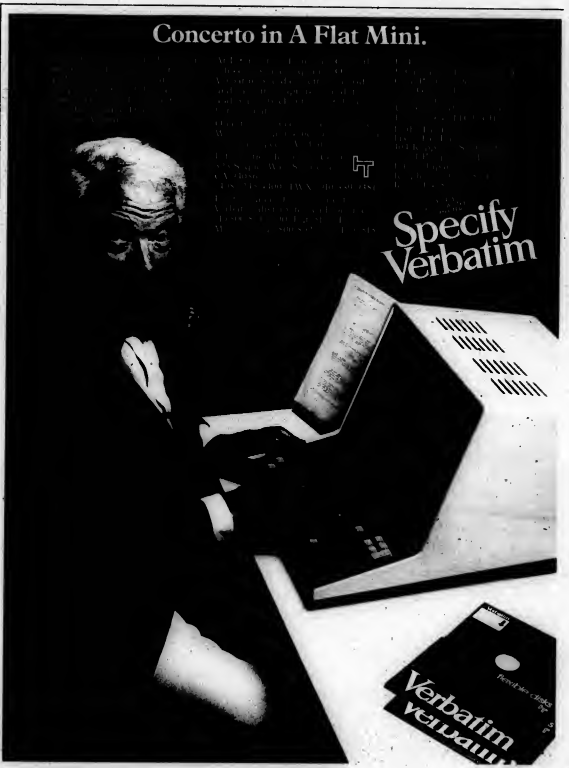

Citizen-Managed Utility Seen Avoiding '1984'

By Ronald A. Frank
CW Staff

KYOTO, Japan — A new type of computer utility — owned and managed by citizens — may avoid the threats now posed to individual privacy, according to Yoneji Masuda of the Japanese Institute for Information Society.

Speaking at a session dealing with the social aspects of computer communications at the recent International Conference on Computer Communication (ICCC '78), Masuda said only through the citizen-managed utility can the information society avoid the dangers of a controlled society.

CW at ICCC '78

Three basic types of information utilities will evolve, as Masuda sees it. These are business-managed, government-managed and citizen-managed.

The Business Utility

The business utility will operate with private capital and will be a for-profit organization. It will be similar to the commercial time-sharing networks now in operation, he predicted.

This type of utility will grow in the advanced, free countries. He pointed out, however, that private utilities would soon drop social welfare services that do not render profits.

The government information utility will be funded from the national budget, and the management goal will be to increase the general welfare of the people. This type of utility will draw revenue from both taxes and network users. The information processing and services of this utility will include all types of government statistics and government policy information.

Rates for this utility will be the same as for the business utility: an hourly charge for processing plus a basic fee to access the utility, Masuda noted.

The government-type of information utility will grow initially in the socialist countries where it will be characterized by low rates and determination to serve the public good, according to Masuda. The disadvantages of this type relate to the inefficiency of a bureaucratic organization and the threat of excessive government control. The latter area could affect individual rights, he remarked.

Most Novel Utility

The third and most novel utility will be citizen-managed, with capital raised by citizens. The management goal of this utility will be the voluntary creation and utilization of information by citizens.

The operations base will consist of citizen-raised maintenance funds, network usage fees and voluntary contributions. Rates charged for access to this citizen utility will be based on an individual's income, in addition to a standard network access charge, Masuda explained.

Difficulties associated with this concept include the inability to raise the necessary capital, the lack of highly trained specialists and inefficient management. Each citizen must have a high degree of civic awareness and motivation to contribute to such a computer communications offering, he added.

Despite the drawbacks, only with this type of utility can the dangers of a controlled society be avoided, Masuda believes. If the citizen management protects personal information and, if the network is used to improve private lives, then this type of offering will succeed.

The citizen-operated utility has the capability of improving the quality of social activity and maintaining the individual in a healthy, active state. These social benefits will be unlike any before, he explained.

Pay Heed to Total System, Standards Makers Urged

By Ronald A. Frank
CW Staff

KYOTO, Japan — The trend in standards making today seems to be aimed at satisfying immediate needs without properly studying the total systems impact, according to Harold C. Folts, a senior engineer with the U.S. National Communications System.

Speaking at a session about network interfacing at the recent International Conference on Computer Communication (ICCC '78), Folts, a participant in various standards-making committees, said that "in the frenzy of developing interface standards for data communications applications, little attention has been given to the total perspective of the picture."

Among the issues that need immediate attention, Folts listed the relationships of the total spectrum of applications for which data terminal equipment can be used as well as the total range of telecommunications services that may be provided by public networks.

Folts charged that as a result of piecemeal approaches, the Consultative Committee on International Telegraph and Telephone (CCITT) is simply trying to satisfy immediate needs without considering the total systems impact.

A proliferation of standards seems to be emerging which may result in data terminal equipment and operating procedures becoming so complex that the user will lose the flexibility and economic benefit gained from having standards, Folts noted.

After reviewing the current status of various standards-making areas, Folts called for an "orderly evolution" into the future to avoid further proliferation. Basic criteria must be established to set the direction.

This path should not be so constrained that it suffocates innovation and advancing technology, Folts advised.

The emergence of microprocessor technology is probably the most profound factor influencing new work. As a result, procedural software considerations take precedence over hardware and logical considerations of the past. This adds flexibility since variations can be more easily accommodated, he explained.

This ease of accommodation should lead to a considerable reduction in controversy over issues affecting national alternatives. But it does not mean wholesale alternatives should be allowed to meet any whim, Folts stressed.

The jungle of data commmunications standards can become an orderly cultivated field supporting the spectrum of user applications efficiently and economically, he said.

Turning to the adoption of the X.25 standard, Folts said the standard for packet-switched services includes the first interface to explicitly describe the three levels of data communications architecture. This work must continue in an orderly fashion.

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But Solution Held Possible

Nations Seen at Odds on Software Protection

CW at ICCC '78

By Ronald A. Frank
CW Staff

KYOTO, Japan — After 10 years of study, there is still no unity of opinion among nations on the legal protection of software, according to George K. Davidson of the Canadian Department of Communications.

Speaking at a session on privacy and security at the International Conference on Computer Communication (ICCC-78) here recently, Davidson said the World Intellectual Property Organization (Wipo), a nongovernment body representing many nations, has decided that full protection cannot be given to software under existing laws. As a result, Wipo has drafted a model for a new law.

On the other hand, Great Britain and the U.S. "lean heavily" toward copyright protection, but their arguments concerning the key issue of software use in a computer are neither similar nor convincing, he said.

In Canada, two government white papers concerned with patent law and copyright law, respectively, have separately proposed that no protection be offered for the use of software in a computer.

In addition, Japan has elected to support patent law so long as "laws of nature" are excluded from the conception of the program.

Working Solution Possible

However, despite the divergence of views, it is possible to suggest a working solution to the problem, Davidson said. Software, including programs and data bases, undeniably has rights to protection under both patent and copyright laws as they exist. In the case of copyright law, protection should be improved by minor modifications, he said.

The ultimate issue of software use in a computer may eventually require a new law, but there is reason to defer such a new law because technology in the form of microcircuits may be well on the way to "producing its own solutions," he said.

In order to make the most of the present situation, three assumptions are necessary, according to Davidson. First, a broad definition of software, including programs as an element, should be used. Second, it should be recognized that software can be either nonresident or resident in a computer. And third, no requirement should be placed on present laws that would reduce their effectiveness.

Three More Assumptions

Policy decisions can be made in this area, he continued, based on three assumptions: that all nonresident software will be protected under copyright; that resident software may be protected under existing laws; and that resident software will be protected and new laws will be written.

The main argument advanced for protection of resident software under copyright law is that when a program is running in a CPU, this constitutes only a simple set of instructions in the program. This argument must be rejected because it "undervalues the performance of a computer system," Davidson said.

Rather, a CPU running an applications program goes through a powerful set of operations controlled inherently by its hardware and operating system and only incidentally by the particular applications program.

If these arguments are accepted, then the second assumption could be changed to state that resident software may be protected under existing patent law.

Operating Systems Patentable?

It should also be accepted that resident software cannot be protected under copyright law. As a result, operating system software may be patentable and could also be copyrightable, according to Davidson.

While systems software may be protected under patent law, Davidson suggested that such use of the law should be discouraged "in every practical manner."

There is still a gap in the protection of resident software, but Davidson advised waiting to see what happens with technology before drafting new laws to cover this area.

Three-Day Computer Show To Open in Toronto Soon

TORONTO — "People, Data and Systems," will be the theme of the upcoming 1978 Canadian Computer Show, to be held at the International Centre of Commerce here Nov. 28-30.

Sponsored by the Canadian Information Processing Society (Cips), the conference will offer three sessions per day, and each day will have its own subtheme, according to a Cips spokeswoman.

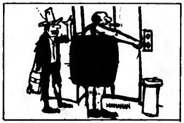
The first day's theme will be "The DP Staff Dilemma: How Much Talent Do You Drive Away?" Sessions will include "Career Opportunities for the DP Professional," "How to Keep Your DP Staff" and a panel discussion on "Is Our Raw Material Suitable?"

The second day's overall theme is data and will include "The Technology of Data Storage," "Public Access of Data" and "Business Data Communications in Canada."

"Systems Are For Users — Displacing Motherhood With Methodology" will be the theme of the third day. Sessions that day will include "An Update On User-Oriented Approaches to Information System Development," "Determining Information Requirements" and "Incremental Information System Development — A Prototype Approach."

The registration fee is $45 for one day, $85 for two days and $125 for all three days, if paid in advance. At the door, the fee for one day is $60, for two days, $110, and for three days, $150.

Additional information is available from Cips, Suite 214, 212 King Street West, Toronto, Ontario, M54H 1K5, Canada.



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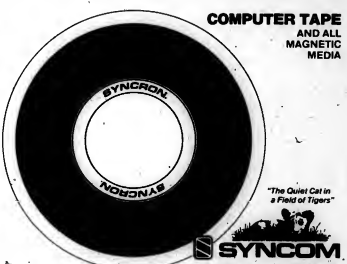

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Computerized Mail Seen Future Office Benefit

By Ronald A. Frank
CW Staff

KYOTO, Japan — The real benefits of the office of the future may lie in computerized mail instead of word processing. And if the behaviorial problems can be overcome, computer mail could provide the greatest benefits in office automation, according to James H. Bair, a senior information scientist at SRI International.

Word processing concentrates on streamlining the secretary-typist functions in the office, but statistics show that this function accounts for only 6% of the labor costs of U.S. business, Bair told a session on computer-based office systems at the recent International Conference on Computer Communication (ICCC '78) here.

In contrast, nonclerical labor costs account for 66% of total costs, and this is the area where the real payoff for the office of the future may be, he said.

CW at ICCC '78

Only 20% of the average secretary-typist's daily time is devoted to typing, so word processing systems are aiming at only a small portion of regular office operations. But a study of activities by nonclerical office people shows a greater potential for computerized benefits, he said.

Bair defined the nonclerical area as consisting of two categories: managers and professionals. According to one study, 95% of typical managerial functions are related to written and oral communications. Professionals or nonmanagers spend about 63% of their time engaged in written and oral communications, he explained.

It seems reasonably certain that technology in the form of computer mail can be used to support the communications functions in the nonclerical area. Several systems are already in operation to test the benefits of computer technology as a means of interpersonal communications in office automation systems, he said. One example is computer-based message systems used in the Arpa network.

These systems have shown that benefits in four areas can probably be translated into labor savings. The first of these is a reduction in what Bair called "shadow functions." These are the unpredictable time-consuming operations associated with typical tasks in the interpersonal communications process.

For example, only 28% of business phone calls make connection with the called party. The rest of the time is consumed by shadow functions such as leaving messages for the intended recipient, Bair noted.

A second benefit area would be message cuing, which he defined as a potential labor savings based on the elimination of interruptions. Phone calls are now delivered at times when ongoing work is interrupted, and these interruptions have a strong negative impact on the quality of work. That effect could be eliminated by a cuing system that would deliver messages at appropriate times.

The third benefit area lies in automating such routine functions as addressing, labeling, dating, formatting, distributing, storing and signing. Even if these operations are performed by a secretary, the tasks must first be explained. Automation would allow direction control of these types of operations.

The fourth benefit area was defined by Bair as media transformations. Included, for example, were changing the medium of the message from speaking to writing, from handwriting to typewriting or from dictation to typewriting. A reduced number of such transformations would be required if the system were computerized.

Profound Changes

Profound changes in the fabric of organizations and the sociology of interpersonal communications would be associated with these areas, Bair pointed out. But to date, "no negative consequences of computer-mediated communications that would be cause for limiting usage have been uncovered," he told the attendees.

Attaching cost savings to the computer mail area is difficult, but the savings can be estimated based on currently available systems. Using Hewlett-Packard Co.'s Comsys and Tymnet's OnTym services, it is generally accepted that it costs less than $1 per message, Bair said.

Assuming that a user will send and receive an average of four messages per hour, and using a composite figure of $2 per message sent and $1 per message received, a typical hour's worth of messages would cost about $6. Using an estimated six hours of communications per day, this represents a 33% reduction in potential labor savings, Bair explained.

Stressing that these figures were conservative, he added that more study is needed. Nevertheless, he said, it can be concluded that computer-based interpersonal communications technology is cost-effective.

Despite the apparent benefits, major questions remain. Typing is required by all users and since some people look on this function as demeaning, they have not developed this skill. But most executives and administrators can learn to type on a computer terminal

(Continued on Page 23).

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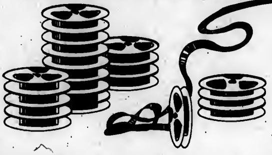
TFAST IS THE KEY

The TFAST Tape Management System has been used by over 250 DOS users for over three years. TFAST provides more features, offers greater versatility and is supported better than any other similar system.



PROTECTION The tape management system protects the tape reels being managed by the system against accidental destruction of active data. This protection is provided even when the system is operating in an 'inactive' status.

AUTOMATIC VOLUME RECOGNITION (AVR) Physical unit assignment of tape drives is resolved automatically by the system, eliminating the need for specific job control assignments. For input files the proper volume serial number is obtained from the DSN File for the version or generation specified and the assignment made to the drive upon which it was found. For output files the assignment is made to the drive upon which a scratch tape being managed by the system is found.

AUTOSTOP If the required I/P or O/P tape is not mounted, the TFAST system will automatically put the partition in the stop state, thus freeing the console and the transient area. The TFAST system will re-scan the drives and de-activate the partition at periodic intervals before requiring operator intervention. Especially valuable if an on-line system is running in another partition. Number and length of intervals determined by user.

EASE OF OPERATION In a multiprogramming environment it is often difficult to know which tapes should be premounted for use with AVR. When AVR is unable to locate a pre-mounted tape, the operator is given complete mounting instructions (except for the physical drive to be used, since mounting on any drive is accepted). Upon selection of each output tape the operator is given complete labeling information for the preparation of external labels.

EARLY DEVICE RELEASE In many programs tapes are used only during the initial portion of program execution. This feature of the TFAST system permits the release of a tape drive upon the completion of the close sequence thus permitting another partition to use the resource.

IMPROVED RESOURCE UTILIZATION With the automatic volume recognition and early device release features, most user installations will be able to concentrate their tape usage since tape drives are no longer 'reserved' for each partition. This results in either increased capacity, or, may lead to a reduction in the number of physical devices required by the installation.

ON-LINE INQUIRY AND UPDATE CICS Real-time access to DSN provided at no extra cost.

COMPATIBILITY The TFAST system is compatible in all respects with DOS, DOS/VS, EDOS, or DOS/MVT. It is transparent to all programs and requires no user storage. Transient and SVA versions available.

REPORTING/DSN ACCESS METHOD The TFAST system provides a comprehensive report of tape activity. A DSN access method is also provided so the user may customize reports that may be unique to his installation.

SYSTEM AUDIT TRAIL REPORTING Provides ability to reconstruct DSN File in the event of hardware malfunction. Reports all activity regarding data-sets.

VAULT MANAGEMENT SYSTEM Provides comprehensive inventory and data-set movement reporting. Includes slot management within multiple vault locations.

The TFAST Tape Management System is designed to assist in managing the magnetic tape library of any data processing installation running under control of DOS, DOS/VS, EDOS or DOS/MVT. This operationally oriented system is sufficiently flexible to permit use in installations which previously employed little or no standards in their handling of magnetic tape reels, yet insures against accidental destruction of any active data files being managed by the system.

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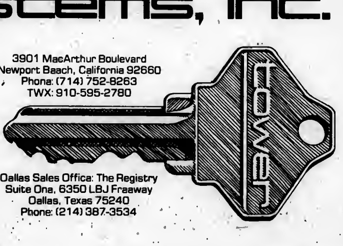

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Models to Help Predict Global Climatic Change

By **Jake Kirchner**
CW Washington Bureau

CORVALLIS, Ore. — Sophisticated computer modeling techniques are being used by a research group at Oregon State University to make predictions on earth climatic changes and to gauge man's effect on the world's climate.

Supported by a $225,000 grant from the National Science Foundation (NSF), the Climatic Research Institute (CRI) here is using a Cray Research, Inc. Cray-1 large-scale system to refine several computer models of global climate. The models will later be used to predict climatic changes.

The purpose of the project is "to learn why climate is the way it is and what controls the changes of climate that we know have gone on and that we expect will go on," according to Prof. W. Lawrence Gates, the institute's director.

On a more practical level, Gates noted, climate "has an enormous impact on man," and it would be very valuable to know what changes in the climate will take place and what effect, if any, man has on climate.

Carbon Dioxide

The first major experiment, he said, will be to raise the level of carbon dioxide in the model to try to determine the effects on global climate of the atmosphere's increasing carbon dioxide content. Through the burning of fossil fuels, man has raised the worldwide level of carbon dioxide about 20% since the beginning of the industrial revolution 100 years ago, Gates explained.

He predicted that by early in the next century, that level might be 100% higher. Such a level could produce enough warmth in the atmosphere to melt the polar ice regions, drastically changing the climate of the world, with severe concomitant economic changes, he said.

Since 1971 the institute has been refining two computer models — a numerical model of global atmosphere and a numerical model of global oceans. Gates said the researchers have been looking at "how well [the model] simulates what the real world looks like."

They try to define what is happening with the climate and use that information to refine the models. Gates said they compare the models' projections with known data, such as that provided by weather satellites.

Bob Mobley, the institute's director of computations, explained that the models contain grid lines for every five degrees of earth longtitude and every four degrees of latitude. The models provide climate values for the intersections, or nodes, of the lines.

Values programmed into the model for each node on the grid include those for wind velocity, ground temperature, air temperature, barometric pressure, definition of surface (such as desert, forest or grassland) and solar radiation.

The models, which are written in Fortran, produce information on a global scale that can then be analyzed by different regions, according to researcher Gates.

Forward Integration

Mobley explained that the researchers start with the values provided for the model grid and then integrate forward in time, using a set of differential equations. Using the Cray-1, he said, they can simulate one day of the world's weather in 40 seconds of computer time.

The Cray-1 is owned by the National Center for Atmospheric Reseach in Boulder, Colo., and accessed over dial-up lines by the Oregon researchers. Because the Boulder center is also financed by the National Science Foundation, CRI is allotted free computer time, Mobley said.

For 1978, he said, the project was allotted 50 hours on the Cray-1 as well as 50 hours on a Control Data Corp. CDC 7600, also at the Boulder center. CRI hopes to be given 100 hours of Cray-1 time next year, Mobley said, as well as time on a National Aeronautics and Space Administration Amdahl Corp. 470V/6 located in Greenbelt, Md.

Renewable Grant

The NSF grant is renewable for another two years, and the institute is hoping for an increase next year over the 1978 $225,000 figure, Mobley said. A major item in the institute's budget will be the purchase of a minicomputer to access the several mainframes the group will be using, he said.

Mobley said he has not issued a procurement request for the mini yet but will be looking for something in the Digital Equipment Corp. PDP-11/70 class.

A minicomputer has rarely been used to access one or more large mainframes on as large a scale as the institute plans, Mobley said.

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Tells Others to Get Involved

Student Winner Reflects on Israeli DP Contest

By Denise Petski
CW Staff

NEWTON, Mass. — Qualifying for an all-expense-paid trip to Israel was hard enough for Eric Enderton to believe when he and three other team members were selected to compete in the Jerusalem Conference on Information Technology's International Youth Competition in Computer Science in August. But to actually win was beyond belief, 16-year-old Enderton said in a recent interview here.

The Santa Monica (Calif.) High School senior, accompanied by fellow team members Alex Melnick and Chris Pettus, won the programming competition in Israel by scoring 195 out of 200 possible points in the final competition. The U.S. team beat Emek Hefer Regional High School and Midrashiat Noam-Yashiba High School of Pradeff-Hanna to win the cash prize of 5,000 pounds, or approximately $250.

The U.S. contenders qualified for the final competition by first winning a local and semifinal competition, both of which were held in California. In the local competition, the team competed against about 20 other teams. The entrants were given a written examination, a programming problem to be solved at a terminal and a short oral quiz, Enderton explained.

In the semifinals, the contenders were reduced to four teams — two from Southern California and two from Northern California. The requirements were the same as for the local competition but without a written examination, Enderton said.

Jerusalem Competition

Victory in the semifinal competition brought the Santa Monica team to Jerusalem.

In the first part of the final competition, each member of the team — while seated at a computer terminal — was given 1-1/2 hours to solve two out of three programming problems. The second part consisted of a two-hour question-and-answer period in front of an audience. Each part was worth 100 points; 200 total points were possible.

All programming for the competition was done in Basic, according to Enderton. The Santa Monica team programmed in Digital's Basic Plus and said it helped them win the competition, especially with one question which involved a recursive function.

During the question-and-answer portion of the competition, the team members were seated at their terminals onstage. Each team member was given an identical mathematical question in an envelope. He worked independently to solve the problem, using the terminal if he wished.

Eric Enderton

There were a total of six questions to be answered in three to five minutes. The written answers were handed to the judges for their decision, which was then read aloud to the audience.

Enderton noted that teammate Alex Melnick was able to figure out the answer to one question faster mentally than Eric could by programming the question into the terminal.

Fascinating Place

Israel proved to be a fascinating place for the students, with Israeli families in Tel Aviv hosting the young men at their homes. An interesting side trip for Enderton was a visit to the home of his host family's relatives. The sights of Jerusalem and Bethlehem were enjoyed by all during available free time.

Enderton pointed out that he was introduced to computers and programming by his father who is a mathematics professor at the University of California at Los Angeles. He took his first and only computer programming course in the eighth grade.

Enderton attributed his success in programming to the availability of his high school's computer facilities and the experience and guidance of older students at the school. He is well-versed in Basic, Fortan, Cobol and at least two assembler languages.

Employed as a part-time computer programmer at RCW Computing

(Continued on Page 22)

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Five-Day Course to Cover Structured Design, Coding

WASHINGTON, D.C. – A five-day workshop in structured design and programming will be held here Oct. 30-Nov. 3.

Sponsored by the Brandon Systems Institute Public Service Corp., the workshop is intended primarily for programmers, systems designers and systems analysts engaged in the development, implementation, conversion and maintenance of applications or system software.

Upon satisfactory completion of the course, according to sponsors, attendees will be able to define, design and program a structured module using functional specifications, basic control patterns and formatted code; a structured program using functional decomposition; and a structured system using data flow analysis, functional decomposition and flexible resource allocation.

The course fee is $695, which includes each day's luncheon and reference materials. More information is available from Brandon Systems Institute Public Service Corp., 4720 Montgomery Lane, Bethesda, Md. 20014.

Knox Honored At IIA Meeting

PHILADELPHIA – William Tyndall Knox, founding board president of the Information Industry Association (IIA) and former director of the Department of Commerce's National Technical Information Service, was inducted into the Information Hall of Fame at the association's annual meeting here recently.

Celia Deese Knox accepted the award, presented posthumously to recognize her husband's service to the industry as a pioneer in the field of information.

"Without the foresight and hard work of Bill Knox, the information industry might not have an association today to focus public attention on its contributions and to represent its view in the area of government relations, copyright and other vital issues," according to Paul G. Zurkowski, current IIA president.

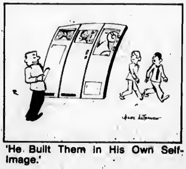
Student Winner Ponders Meet

(Continued from Page 21)

Services in Santa Monica, Enderton is considering either computer science or music (possibly computer-aided synthesis) as a career. Enderton lists his favorite hobbies as computer programming and jazz piano.

When he entered his senior year at Santa Monica High School last month, fellow team member Alex Melnick entered his freshman year at the University of California at Berkeley and Chris Pettus entered his first year at the University of California at Los Angeles.

The Fourth Jerusalem Conference will be held in the next two to four years and Enderton encouraged other high school students to become involved in the worthwhile, educational experience. Interested persons may contact Anthony Ralston, conference chairman, State University of New York at Buffalo, 4226 Ridge Lea Road, Amherst, N.Y. 14226.



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Conference to Examine Data Regulation Issues

NEW YORK — The International Conference on Data Regulation — European and Third World Realities will be held at the Sheraton Hotel here Nov. 28-30.

The conference will present international representatives from commerce, industry and government to analyze the burgeoning problems of transborder data flow and to provide information to aid in the planning of future international activities, according to the conference sponsors.

Among the 40 speakers taking part in the program are Jan Freese, director-general of Sweden's Data Inspection Board; Hans-Peter Gassmann, head of information for the Computer Communications Policy Group of the Organization for Economic Cooperation and Development; and Gerhard Stadler of the Austrian prime minister's office.

Key American participants include Henry Geller, assistant secretary for information and communications, U.S. Department of Commerce; Richard Neustadt, assistant director of the White House Domestic Policy Staff; and William Norris, president of Control Data Corp.

Session Topics

Sessions will include "Data Flow Developments: Legal and Economic Dimensions"; "National Privacy Concerns and Actions," including the fundamentals of existing legislation and the question of international legal harmonization; and "Information and Communications Programs of International Organizations."

Also presented will be a session called "Towards a New World Information Order," which will examine global computer-communications opportunities and the establishment of national information strategies; "Multinational Corporations and Transnational Information"; and "Development of U.S. Policies."

The conference is being sponsored by Online Conferences Ltd., a British organization that specializes in the coordination of conferences in the fields of information processing and communications technology.

The delegate fee is $685, including documentation, daytime refreshments and a cocktail reception. Further information is available from The Wayne Smith Co., Suite 810, 500 12th St. S.W., Washington, D.C. 20024.

Future Office Benefit Seen

(Continued from Page 18)

with little difficulty.

If computer mail systems are implemented in the automated office, won't the remaining work expand to fill the available time? Is interpersonal communications via computer mail as effective as traditional modes of interaction? With regard to the latter, a certain level of face-to-face communications may be a fundamental human need, according to Bair.

Certainly more involvement and research is needed to study the human factor in this area, he said.

It is possible that increased productivity from the implementation of computer mail systems could lead to unemployment. But at the same time, low productivity among white collar workers "seems to be contributing to a general weakening of the U.S. economy, especially when it is compared with more industrious nations such as Japan," Bair said.

In any case, the evolution of technology to support interpersonal communications is here, and the prospect that such a system can be cost-effective is encouraging, he concluded.

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Nov. 8-10, Washington, D.C. — **1978 Analyzer Users Conference**, sponsored by Program Products, Inc. Contact: Michael Suscreba, Program Products, Inc., 95 Chestnut Ridge Road, Montvale, N.J. 07645.

Nov. 9, Framingham, Mass. — **Microfilm Technology Seminar**, sponsored by the National Micrographics Association, New England Chapter. Contact: Gary L. Moore, Seminar Chairman, c/o Ingersoll-Rand Co., 150 Burke St., Nashua, N.H. 03060.

Nov. 12, New York — **How to Be an Entrepreneur in the Information Industry**, sponsored by the American Society for Information Science's (Asis) Special Interest Group on Management of Information Activities. Contact: Asis, 1155 16th St., N.W., Washington, D.C. 20036.

Nov. 13-14, Houston — **Planning and Initiating the Data Base**, sponsored by Performance Development Corp. (PDC). Contact: PDC, 1101 State Road, Building M, Princeton, N.J. 08540.

Nov. 13-14, San Francisco — **Managing Data as a Resource**, sponsored by Data Resource Management Associates. Contact: Arnold Barnett, Data Resource Management Associates, 19 Orchard Way North, Rockville, Md. 20854.

Nov. 13-14, New York — **Federal Procurement Process**, sponsored by the University of Chicago. Contact: Heidi E. Kaplan, Department 20NR, New York Management Center, 360 Lexington Ave., New York, N.Y. 10017.

Nov. 13-15, San Francisco — **Data Processing: An Introduction to Concepts and Systems**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 13-15, Washington, D.C. — **Increasing EDP Usage and Benefits Through Organizational Communications**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 13-15, Chicago — **Data Communications — Effective Network Design**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 13-15, Cherry Hill, N.J. — **Data Entry Management & Supervision Seminar**, sponsored by Management Information Corp. (MIC). Contact: Denise King, MIC, 140 Barclay Center, Cherry Hill, N.J.

Nov. 13-15, Los Angeles — **Interface West**, sponsored by Interface West, Inc. and *Datamation* magazine. Contact: Sheldon G. Adelson, conference director, Interface West, Inc., 160 Speen St., Framingham, Mass. 01701.

Nov. 13-15, New York — **Zero-Based Budgeting: A Planning Approach for Increased Productivity**, sponsored by the American Institute of Planners. Contact: Irving Levinson, Conference Manager, U.S. Professional Institute, 11009 Inwood Ave., Silver Spring, Md. 20902.

Nov. 13-16, Chicago — **Computer Software & Applications Conference**, sponsored by the IEEE Computer Society. Contact: Harry Hayman, P.O. Box 639, Silver Spring, Md. 20901.

Nov. 15-16, San Francisco — **How to Build and Use a Data Resource Directory**, sponsored by Data Resource Management Associates. Contact: Arnold Barnett, Data Resource Management Associates, 19 Orchard Way North, Rockville, Md. 20864.

Nov. 15-16, Kansas City, Mo. — **1978 Mid-America Electronics Conference** (Maecon), sponsored by the Kansas City section of the Institute of Electrical and Electronics Engineers. Contact: Maecon, P.O. Box 4356, Overland Park, Kan. 66204.

Nov. 15-17, Chicago — **Distributed Systems: Are They Right for You?**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 15-17, New York — **Effective Computer Operations**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 15-17, New York — **Effective Executive Speaking**, sponsored by American Management Associations (AMA). Contact: AMA, 135 W. 50th St., New York, N.Y. 10020. Also being held Nov. 20-22 in San Francisco.

Nov. 15-17, Stockholm, Sweden — **Microtech 78**. Contact: Microtech 78, c/o Stockholm Convention Bureau, Strandvagen 7 C, 114 56 Stockholm, Sweden.

Nov. 15-18, Anaheim, Calif. — **1978 Western Educational Computing Conference**, sponsored by the California Educational Computing Consortium. Contact: Oliver Seely Jr., program chairman, Department of Chemistry, California State University, Dominguez Hills, Carson, Calif. 90747.

Nov. 16-17, San Francisco — **Data Communications: Advanced Concepts and Systems**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 20-21, Chicago — **Understanding Proprietary Software and How to Buy It**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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Managers on the Move

Spinelli

Thomas

ROSS F. SPINELLI has been named Director of DP at Bolton-Emerson, Inc. in Lawrence, Mass.

Spinelli was previously employed for nine years as DP manager for Gamewell Corp., formerly a division of Gulf & Western Industries.

• • •

KEITH THOMAS has been promoted to senior vice-president of DP at Commercial Federal Savings & Loan Association in Omaha, Neb.

Thomas joined Commercial Federal's DP department in 1961. He was named assistant vice-president and director of the department in 1970, then vice-president in 1973.

He attended Omaha University.

• • •

RONALD NIPER has been elected a vice-president in Irving Trust Co.'s computer processing division in New York City.

A graduate of Pace College, Niper joined in 1977 as an assistant vice-president. Prior to that, he was an assistant vice-president of the European American Bank, where he was manager of equipment research and software development in the computer operations area.

• • •

MARILYN T. WELLES has been appointed security manager for the Comnet Corp. in Washington, D.C..

Welles, a graduate of Albright College in Reading, Pa., was previously employed at Booz, Allen & Hamilton.

• • •

KINLOCH F. DUNLOP III has become director of information systems at Wilton Enterprises, Inc., a Chicago-based division of the Pillsbury Co. .

Dunlop was previously employed as director of systems and DP for Congoleum Corp. in Milwaukee.

• • •

FRANCIS B. PHELAN has been promoted to the position of day manager/DP computer operations of *The Washington Post* in Washington, D.C.

Phelan joined *The Post* in 1977 as a computer operator and was promoted a year later to computer operations supervisor. Before that, Phelan was computer operations manager for the U.S. Chamber of Commerce.

• • •

FRED C. DAVIDSON, VIRGINIA C. BURTNETT and RICHARD D. PULLINGER have been named to new positions in GTE Data Services' Northern region.

Davidson, formerly management information systems manager in corporate accounting for GTE Sylvania, has been named northern regional network director. Burtnett, formerly Midwest regional operations manager, has been appointed Fort Wayne data center director, and Pullinger, formerly Northwest regional services director, has been named Erie data center director.

Davidson holds a master's degree in economics from the University of Virginia. He joined GTE in 1952 as a systems and programming supervisor.

Burtnett is a graduate of Vanderbilt University. She joined GTE in 1972 after working as a programmer for the General Telephone Co. of California.

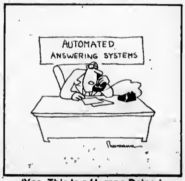
Pullinger was employed by the Bell Telephone Co. of Pennsylvania before joining GTE in 1969 as a systems supervisor for the Fort Wayne data center.

• • •

STUART J. YUILL has been appointed senior director of data communications services at Aeronautical Radio, Inc. in Annapolis, Md.

Yuill was employed by the Defense Communications Agency before joining the Aeronautical Radio, Inc. Research Corp., where he was a principal engineer.

Yuill is a graduate of Johns Hopkins University with a B.S. in engineering. He received his M.S. in electrical engineering from Northeastern University and is completing his doctoral research in the area of computer communications by satellite.



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Editorial

Zapped by the Zip

The impact on DP operations of adding four digits to the Zip Code may not be appreciated by the U.S. Postal Service, which recently announced that the digits will be added by 1981 "to help keep down postage rates" [CW, Oct. 2].

The transition from a five- to a nine-digit format will force many DP departments in the private and public sectors to undertake a massive rewriting of data base software. Since the Postal Service monopolizes the mail industry — which is vital to any organization — it plays the music to which all businesses and agencies must dance.

DPers therefore must adapt to this new format in the next three years. Many face nontrivial and costly programming tasks in the changeover process, including redefinition of data structures and rewriting I/O routines and job control procedures.

Further, the hardware constraints of existing systems may impede or even prevent the changeover, forcing DP management to extend or replace system configurations.

For example, many software designs have Zip Codes stored as elements of arrays written in a high-level language. On many computer systems, five-character strings may be stored as array elements, but not nine-character strings.

In such cases, the nine-digit Zip Codes could not be stored or manipulated in the same manner as the old codes; hence, a different software design would be needed.

Moreover, the size of disk files will have to be extended to accommodate the new format, entailing a need for more memory. Another consequence could be a significant hike in I/O and network communications costs as the number of characters per jobstream grows.

The Postal Service plans to employ optical character recognition equipment to scan the nine-digit codes, allowing "eight or nine [postal] workers to do the work now done by 20," according to Postmaster General William F. Bolger. The extra four digits will designate a street block, allowing more efficient sorting of letters and parcels on the basis of mail carrier "beats."

Although the extended Zip Code could make life easier for postal workers, it is not clear whether any benefits will be passed to the whole of society. Postal rates are not likely to decrease, so at best the policy change will retard an inevitable increase.

But what difference does this make if a leveling off of one set of charges is more than offset by a rise in another set of charges — the costs associated with DP?

Unless the Postal Service can reasonably argue that a nine-digit format will benefit the society it supposedly serves, rather than just itself, the DP community — among other segments of society — should protest this policy change.

Even if the changeover is justified, there should be strong assurance that, in the style of postage rates, a 15- or 20-digit format will not follow soon afterward.

Data Past

Eight Years Ago
Oct. 14, 1970

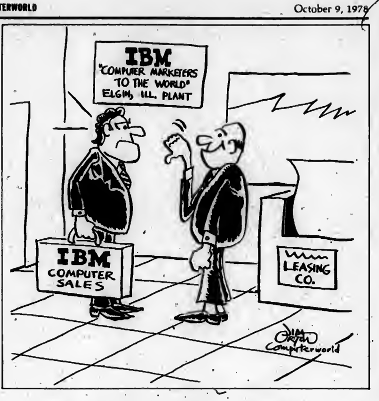
DETROIT — As the time for the general election in November drew nearer, more and more irregularities with the August primary were discovered. Many of Detroit's troubles with an extra vote count seem to have been caused by partly perforated punch cards. The improper removal of chads from the punched cards compounded the problem.

— — —

CAMBRIDGE, Mass. — Fifty dollars was the prize in a contest that required designing the most effective plan for destroying computerized information. The contest was sponsored by two graduate students of computer science at Harvard who admitted to being concerned over the potential misuse of the blueprints for sabotage, but they considered the contest the most effective way to arouse public concern over the misuse of computers and to deter large organizations from abusing privacy and data banks.

— — —

NEW YORK – Burroughs Corp. unveiled a family of systems that would succeed the B5500 and more powerful systems. The B700 series was unveiled with the announcement of three models — B5700, B6700 and B7700 — which compared with the three announced models of the IBM 370 series and with the top of the 360 line on a price/performance basis. Burroughs also introduced a disk pack storage system, the B9484, similar in performance hut lower in price than the IBM 3330, and an expanded head-per-track disk drive, the B9472, for use with the company's optimized access memory banks, which queue randomly accessed data.



Letters to the Editor

Intention Missed

Judging by some reactions I received personally and by Stockenberg's letter [CW, Sept. 25], *Computerworld*'s decision to omit the last two paragraphs of my article on IBM's Extended Control Program Support (ECPS) [CW, Aug. 28, Sept. 4] has caused some people to come to a conclusion in direct opposition to the intent of the article.

First, the benefits of ECPS were not ignored. It was the intent of the article to argue that, despite the significant improvement in performance, it is the functional improvement that is the most significant aspect of the feature.

Second, the article intended to allay the fears of potential plug-compatible CPU customers by pointing out that a plug-compatible manufacturer could provide a feature such as ECPS. It hardly sounds like sour grapes to point out that IPL offers an ECPS which contains more function than IBM's and will soon have the only 3031-class machine with the full ECPS.

Charles A. Cornell
IPL Systems, Inc.
Waltham, Mass.

Deafening Silence

Up until now, the computer industry has met the new nine-digit Zip Code proposal with deafening silence. It is understandable why vendors would welcome the change; it is a bonanza for everyone from form suppliers to mainframe manufacturers. Addressograph-Multigraph Corp. alone will make a fortune replacing all the obsolete plates.

But where are the users who must pay programming, operations and hardware overtime to change programs, rebuild files and retest practically every nonscientific application in the country?

Write your congressman now. There is a plan to extend the Zip Code again in a couple of years to 12 digits. Apparently, the costs of these conversions to American business and taxpayers are of no consequence to the post office monopoly.

Frances Smith Abernathy
Rockville, Md.

Too Many Bureaucrats

Charles R. Conner's article "Certification Does Not Produce a Professional" [CW, Sept. 18] seemed to squarely meet the issue of certification. A piece of paper does not make someone a professional, nor does it do much to ensure that the holder is either capable or honest. What it does ensure is that someone will make a lot of money out of certifying programmers, analysts or whatever.

Trying to liken a programmer to a lawyer is a poor analogy. Has anyone made a count of the number of lawyers who went to jail (or should have gone to jail) as the result of Watergate? How many congressmen-lawyers have taken bribes from Tongsun Park?

What does certification really do for a programmer? Does it ensure that he is competent, or does it merely show that the programmer is also a good test-taker? How many of us knew people in school who had mastered the art of taking tests but really knew nothing of their subject?

Let's ask ourselves some simple questions: Aren't we regulated enough? Aren't there enough government agencies running our lives without adding another? Aren't there enough otherwise unemployable bureaucrats telling us what to do, and when, and how, without adding a state director of data processing certification and his well-paid (from our tax dollars) staff?

Chris Rohrs
W Chicago, Ill.

The Human Connection

Terminal Training Mode Wins Executives

By Jack Stone
Special to CW

Training top executives who are not in the information systems swim is certainly one of the toughest intellectual challenges we have in the business. The need, of course, derives from the well-known fact that their abysmal lack of knowledge in the area almost invariably leads to poor, if not disastrous, decisions.

Last week, I described three basic rules of concepts training for executives that I have found useful. These rules, which derive from the premise that successful training of top executives requires their intense involvement, are: use interactive terminals, give briefings, not lectures, and put a touch of class into the production.

There's much more, of course, to the development of a successful program. To illustrate, I wanted to relate a recent experience of mine which involved the training of some top executives of one of my customer organizations, who, although they had a background in electrical systems, were very short on data systems knowledge.

I advised my customer of the idea of using interactive time-sharing terminals for basic training in data systems, which constituted only a part of a larger program. My immediate contacts were enthusiastic about the notion, although they indicated that much hard work was necessary to absolutely ensure a successful reception by the "student" executives. There were, however, some advisers who acted as "prophets of doom and gloom." They said the risk of failure by using terminals for executive training was unacceptably large (when contrasted with archaic, but safe, lecture methods) because:

- "They will be embarrassed because they can't type."
- "We will look bad when the mainframe fails, and it will."
- "They will get confused by the logon procedure."
- "They will frustrate quickly when they don't grasp the concepts."

Negatives Overruled

At any rate, the "negative Nellies" were overruled. Here's what we did, working as a team:

There were three hands-on instructional modules, each designed to run for a little more than an hour. The modules covered the three subject areas of: terminal operations (keyboard/screen device in local mode), on-line execution of programs (using canned programs in the time-sharing environment) and on-line program development (with interactive Basic).

Each module was organized into this format: an instructor briefs the audience for about three minutes with a general overview of the systems concepts that will be examined, plus a couple of minutes of comments on the hands-on procedures and projects to be accomplished. Then a short movie is shown, which further explains the concepts to be discussed. The movies were selected because of their capability for presenting the material in a humanistic and not mechanistic kind of way.

For the next step, the attendees filed into the terminal area, where the terminals were already operational and logged on.

Each pair of executives shared a terminal, taking turns at the keyboard, although they were encouraged to work together to figure out the proper entries. Each person had a workbook of our design which used every technique imaginable to make the instructions for each project clear, concise, complete and consistent: large-size type fonts, new project on new page, sample answer (hard copy of a typical interactive sequence) and brief narratives to introduce major groups of projects.

But more important, we tested those sequences over and over again on the terminals to make sure the procedures were flawless.

We also spent quite a bit of time building a project which required that the students use a step-by-step procedure for constructing a small Basic program. We then modified the logic.

The success of the terminal training is best conveyed by this comment from one of the instructors: "When the executives arrived, they were very doubtful they would learn anything about systems. But after the first hands-on session, we practically had to use crowbars to pry 'em loose from the tubes."

Repeating the offer I made last week, if you want a free copy of the second edition of my informal paper on "Training the Top Executive," send a self-addressed, stamped (30 cents) envelope (no. 10) to me at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007. And if you have had any experience with executive training you wish to share (identities not revealed), send it along.

The Taylor Report

Two DP Crimes Covered In One Day in Nashville

By Alan Taylor
Special to CW

On Sept. 26, I was in Nashville, Tenn., to talk about computer crime with the local chapter of the Association of Systems Management (ASM). I came away thinking Nashville had plenty to teach me in a day on the subject. Quite a bit of this knowledge came from the pleasant, intelligent group at the local ASM chapter, but still more came from the local newspapers — *The Nashville Banner*, in particular.

The *Banner* covered two separate computer crimes that day — one case was in court and the other was just taking shape, with the arrest of suspects. First let's examine the case that was in court.

Gary Denami, a 29-year-old former short-term employee in the DP department of the First American National Bank, was arrested last December for attempting to cash bad checks.

While in the jail cell, he reportedly borrowed a match from a pair of drunks locked up with him and burned a $10,000 cashier's check — part of the vital evidence in the case. That $10,000 check represented part of Denami's success in cashing a worthless check.

Denami's defense centered on the computer balance of $78,556.32 in his bank account. Since there was a large balance showing, why was the check "worthless?" I left Nashville before the jury made its decision — but the facts of the crime are important.

Adequate Check?

The First American National Bank used an on-line computer system which was only balanced every 24 hours but which paid out within minutes. Verification of the input before payment consisted only of checking that it had come in on "one of the bank's phones," according to George Publow, a former assistant manager at the bank.

On Dec. 16, Denami was apprehended with more than a few $15,500 checks made out to himself, on his person, as well as a packed suitcase and a newly acquired passport. He had apparently gone to three of the bank's branches and succeeded in cashing one of the worthless checks before he was arrested. It seems the stack of checks would have just about emptied his registered balance in the computer.

It was found that on Dec. 16, at 9:10 a.m., Denami's bank balance had mysteriously climbed to $78,556.32 as a result of a message from one of the bank's

(Continued on Page 32)

Sociology of Computing

Time-Sharing 'Messiah' Triumps Over Managers

By Miles Benson
Special to CW

Time-sharing is one of those things like pregnancy — you either have it or you don't.

What I mean is, when it comes to the use of time-sharing facilities for software development in a company, the company either does it or it doesn't. Rarely does a company allow programmers or projects the option of choosing between time-sharing and batch development.

Clickety-Clack and Western Railroad is one of those nontime-sharing shops. It is an unwritten company policy that "thou shalt hold no CRT images before thee, and thy testings shall only spew forth from a batch printer." As if, parenthetically, someone had said, "If God intended for people to talk to computers, he would have equipped them with modems."

And Slim Griffen knew that. When Slim hired in at Clickety-Clack five years ago and was given a tour of the computer center, his only comment had been, "But where is the terminal room?" When his manager-escort had responded "The what?", Slim's worst fears had been realized. A computing shop without time-sharing, Slim felt, was like a Cadillac in a gas crisis — it was elegant and impressive, but not of much value.

You see, Slim's computing career had been nurtured at P.Q. Aresti U., a favorite haunt of intellectual folk and a veritable bastion of belief in time-sharing. Basketweaving majors used terminals at Aresti. Janitorial services used a computerized manpower allocation system. And even the football coach played simulated games via a Decwriter in the locker room.

With that background, you may wonder why Slim ever accepted the offer from Clickety-Clack. Well, there are many perversities in human nature. Perhaps the worst of them is a missionary attitude. Slim really believed God was on his side and that time-sharing would eventually become a way of life on his new job. He even saw himself as the Messiah on the White Steed (his training in comparative religion was not up to the standards of his computer science, as you can see) who would ride in and slay the dragon of batch printers.

It was also true that he deeply wanted to live in the Monica Beach area along the Northern California coast, and Clickety-Clack was really the only computing game in town. But that practical explanation lacked romance, and Slim tried not to

(Continued on Page 30)

Time-Sharing 'Messiah' Victorious at Last

(Continued from Page 29)

think of it.

The Messiah biz at Clickety-Clack was frustrating, Slim found. No, not just frustrating — it was impossible. The power structure surrounding Slim hadn't the slightest interest in Slim's terminal-in-every-pot plot. And several years went by in which his White Steed stood around and swished flies with its tail, ate hay and did all the other things White Steeds are wont to do. But it never came near the hatch printers.

But Slim was not a quitter. He still knew he was right. And if logic would not move the establishment, then perhaps being devious would.

Now it chanced that Clickety-Clack was involved in a peculiar business at the same moments in time in which Slim's devious plot was conceived. Although most of the software developed at Clickety-Clack was for internal consumption only ("sticking to our own tracks" was the mildly humorous in-plant expression), a decision had been made to develop some "end-product" software.

In the course of sticking to its own tracks, Clickety-Clack had built a fairly nifty train scheduling algorithm. When some of the other railroads began making inquiries about the system built on that algorithm (it was called Train Automated Routing System, or Tars), Clickety-Clack computing management quickly realized it had a potential money-maker on its hands. Its response to the other railroads was a brief description of the system and a promise that a proposal to define and implement a generalized Tars system for multirailroad use would he forthcoming.

And Slim was assigned to the writing of that proposal. The plot thickens.

A 'Natural'

Slim was a natural to work on the Tars proposal. He had designed most of the system and implemented a fair chunk. And what he hadn't built himself, he had learned inside-out. If anyone knew the Clickety-Clack-specific parts of Tars, the parts that needed redoing, it was Slim.

Well, to get the story moving again, Slim dashed off a technically credible, well-worded, tactically sound proposal in record time. It was when an audit committee was assigned to go over Slim's work before the proposal went out that the thickening plot really almost clotted.

I was assigned to that audit committee — along with two Clickety-Clack computing managers. I was asked to look at the technical details. The managers, naturally, looked at the Big Picture.

Slim had done a superb job. The managers were pleased with the Big Picture. The technical details were impeccable. And it was only on my second reading that I came to realize what Slim had done.

Buried deep in the proposal, in a section labeled "Implementation Methodology," was a pass-over-quickly sentence that said, "Development of the generalized Tars system shall be done in a structured manner, via a modular design and utilizing time-sharing techniques."

On first reading, I had zipped past it as Proposalized Motherhood. If I had quit then, no one else would have ever noticed it. Managers seldom read sections which begin with the word "implementation" or end with "methodology." That level of detail they generally find boring. And, of course, Slim knew that.

Have you got the picture here? Slim had slipped into a formal Clickety-Clack document a promise to use time-sharing. If it went unchallenged and a contract resulted from the proposal, Clickety-Clack's unwritten code *had* to change. Slim, mounted once again on his White Steed, had found a back-door approach to waging his fervent religious war.

And I was standing in his path. It was my responsibility, as part of the audit team, to report my findings. But — and here is where the plot really crystallizes — there was a loophole. Whereas the managers reported their findings to management, I needed only report my findings to the technologist — Slim.

I'd always been somewhat sympathetic to Slim's battle. I'm not sold on time-sharing as a way of life, mind you, but I'd like to see it tried in order to have more data for a better decision.

You see, I love the idea that management's disinterest in the details of computing technology can be used in potent ways against it. I think I slid Slim's devious plot through for that reason more than any other.

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Reader Commentary

A Sad, Partly True Tale

What's in a Name – Or Even in a Number?

By Barbara Mende
Special to CW

Once upon a time, there was a little computer named CIP 2200B. One day, he went to his parents, the Cincinnati Milacrons, and said, "I want to change my name."

"Why?" they asked. "Twenty-two hundred is a fine name, rich in tradition. Your Datapoint and Wang cousins don't mind it."

"That's the trouble," the little computer bleeped. "It's too common: Like 40."

"Don't exaggerate," his parents replied. "Forty is getting really common. It was good for a second name, like 360/40. But now that Dataspeed 40's getting popular, everyone'll be using it. We're sure that before the year is out, there'll be XL-40s and CS-40s and Cado 40s and all kinds of things. Your name isn't like that. But tell us, what would you like to be called?"

The little computer's screen blinked, then intensified. "George," he said.

"George! That's a people name! If you have a people name, you may start forgetting phone numbers!"

"My friend Adam has a people name."

"Adam's strange. He doesn't speak the same language we do. Besides, you always beat him at blackjack. You ought to play more with that PDP-11/03 down the street."

"He's no fun," the little computer said. "He's always doing his math homework. I used to like to play with some of the terminals. I once met one called Disco-Tec. My best friends were Mini Bee and Super Bee, but they moved away."

"Just as well," his parents answered. "You shouldn't be so frivolous. All you ever think about is Star Wars and Tic-Tac-Toe. Why don't you try to emulate the great computers, like 470V/6?"

"I'm only a kid," the little computer protested. "I wish I could play with the software products. They have names like Fats and Jasper and Panda."

"Software! Next you'll be wanting to hang around with the user groups. Now there's one in Chicago called Capone. Well, we'll make a deal with you. Change your name if you want, but we'll only support you for two years, and we won't get all your jobs for you. If you don't make it, that's it. You're on your own."

So CIP 2200B changed his name to George. Everyone admired him, and his big brother CIP 4400 even went into partnership with him for a while. But he couldn't make a living. So, true to their word, his parents cut him off.

Moral: If you think names are better than numbers, be a person or a race horse or a software package. Don't be a computer.

Letters to the Editor

Puzzled by Articles

A couple of articles in the Aug. 28 Special Report section have me very puzzled. "Virtual Memory Aids Support, Eases Upgrades" and "DBMS Now Powerful Tool For Small System Users" directly inferred that virtual memory and data based management systems (DBMS) are extremely valuable assets to both programmers and operators; this is very correct. What puzzled me was the inference in both of these articles that until very recently these characteristics have not been available on small business computers.

I'm not sure whether the blame lies with Microdata's public relations people or with the media, but the time has come to publish a well-documented fact. Microdata began marketing the Reality system to the end-user market in December 1973. Reality provided both a paged virtual memory system and a true DBMS that gave the small business computer user these capabilities.

John R. Kellgren
Scanning Systems, Inc.
Saint Charles, Mo.

It seems everybody is talking about distributed processing. That's understandable: the primary benefit – increased responsiveness to user needs – is an important objective.

But Honeywell is doing a lot more than just talking about distributed processing. Within our Distributed Systems Environment (DSE), we're doing something about it. We can help you with a distributed system – today.

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Two Crime Cases Point to General Problems

(Continued from Page 29)

phones or from the publicly accessible "Anytime" system. Furthermore, it was reported that some months before, Denami had shown his knowledge of the coding system used to mark up advanced deposits, to a new employee. Since that time, Denami had left the bank.

The question before the court was not about entering false deposits — the nature of electronic funds transfer makes that all but impossible to prove — just "passing worthless checks."

Computer Burned

The other computer crime repnrted in the local newspapers that day concerned a computer burned at the headquarters of Treetop Enterprises, a company that runs Waffle House restaurants in Tennessee and northern Alabama. On Sept. 4, an apparent arson attempt was made on the computer and the company records.

After the fire, some partially burned checks and records were found. The company decided to call in the auditors, although they had no previous qualms about the books.

Tho audit turned up a mysterious single entry of $161,000 in the company books. Between March and August, checks totaling $300,000 had been written against this balance — many of them in the $6,000 to $18,000 range.

The day before I arrived in Nashville, the company's receptionist and three outsiders were arrested. Arson charges were expected soon.

Both of these computer crime cases point tn special problems. In the first, electronic funds transfer systems can be counterfeited without being caught because they are based on pulses, not signed documents which can be referenced and used as evidence.

The general problem is that the law is behind the times; paper evidence doesn't apply to electronic funds transfer crimes.

The second case involves the problem of one-sided entry. The $161,000 entry was left uncaught from March to September. Thus, computer accounting systems and check-issuing systems are quite vulnerable to manipulation.

Two in a Day

Finally, let us consider the way the two computer crimes coincided — the Treetop receptinnist was arrested on the opening day of Denami's trial. Sophistication in computer crime is undoubtedly spreading and must now he considered as a general threat.

Nashville may be a center of government, religinus publishing and music — but it's not widely known as a center of computer crime. Still, its newspapers covered two computer crimes in a day, which tells us something about the rapid spread of this type of crime.

We have emerged into a time of rapidly changing security. What was secure last year is not secure now. At this point, improvements in security, rather than in function, should determine whether our computer systems are adequate.

It is our professional duty tn see that effective security is built into all systems. Users may believe in the "It can't happen here" syndrome. Well, if it can happen in Nashville twice in one day, it can happen anywhere at least once a year.

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"The Fortex fixed asset system is proven, concise, well documented... programs compiled, test system run within hours. An uncommon event."

Michael G. Morris
Financial Systems Officer
Virginia National Bank
Norfolk, Virginia

Mr. Morris calls it an uncommon event, but at Fortex it's merely our normal way of doing business. All Fortex software product systems are operational; they are production-proven systems; they are concise and fully documented.

All Fortex systems, fixed asset, credit or A/R; on line or batch are easy to set-up and install because they *are* operational systems. Refering to Virginia National Bankshares' purchase of Fortex PIMS, Mr. Morris stated, "...our data processing folks are much impressed with the concise, tested and well documented manner of the System. The material and information was so clear that the programs were compiled and the test system run within hours of receipt of the tape...an uncommon event."

But we realized our deepest sense of pride from what Mr. Morris describes as, "One of the most significant aspects of my dealing with Fortex...their excellent responsiveness to inquiries regarding use of the system, even in aspects for which it is not designed. This is again an uncommon occurrence in my experience."

When asked what he liked most about Fortex PIMS System, Mr. Morris stated, "to summarize, PIMS is: ☐ a concise, tested system with sound data processing integrity ☐ a well documented, user oriented system ☐ a system with flexibility for implementation ☐ a product from a company which has obvious pride. So, when your priorities dictate a new software package, call Fortex. We can provide you with a proven modular package that features ease of use, technical support, quick response, cost savings, DP efficiency and maximum maintainability.

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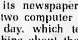

Now choose from five models: IBM 370, NCR Century, System/3, "plain" (pictured above) ... or the new "I HATE MY COMPUTER" which shows a frustrated DP'er strangling his system! Gold-finished, hefty plaster sculptures; perfect paperweight/conversation pieces. $6.95 each, postpaid.

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Morino Enhances TSO Monitor

ARLINGTON, Va. — An enhanced MVS version of the TSO/MON performance monitor is now available from Morino Associates, Inc. The product now permits a user to evaluate selected TSO command activity and performance information at the department, project or user level.

The MVS version of TSO/-MON is available on a perpetual license basis for $9,500; SVS and MVT versions cost $8,900. More information about the product is available from Morino Associates at 1401 Wilson Blvd., Arlington, Va. 22209.

For 3270 Users

ADR Beefs Up Its 'Vollie'

PRINCETON, N.J. — A high-level procedure language, an updated system programmer's utility package and a series of statement syntax checkers are all part of the enhanced comprehensive on-line program development system Vollie from Applied Data Research, Inc. (ADR).

Version 2.0 of Vollie is designed for IBM 3270 CRT workstations and operates under CICS within a DOS/VS environment.

Command Executor

The package contains the Vollie on-line interactive command executor (Voice), which allows the user to write interactive command procedures to perform specific tasks, according to a spokesman. Voice can be used to execute a group of commands as a single command; accept input from terminals and write responses back; read from and write to members of the system's on-line library; and create screen formats for data entry.

The Voice procedures can also be used for arithmetic problem-solving applications, the spokesman added.

System programmers can utilize a number of commands that were recently added to the Vollie utility package. Users can display the directories of all active DOS libraries, volume table of contents (VTOC) information or data from the core image libraries; they can also change data in the libraries and any on-line files, the spokesman continued.

Syntax Checkers

In addition, syntax checkers allow programmers to determine whether JCL, JECL or Cobol statements are syntactically correct and whether the sequence of statements is valid. An invalid statement is highlighted by an error message which precedes the statement in question, the spokesman stated.

Vollie's standard library storage facilities and on-line data entry and editing capabilities are, of course, included with the 2.0 package.

The software is available under permanent license for $11,500; on a monthly basis for $420/mo; and on three- or five-year leases for $371/mo or $305/mo, the ADR spokesman said from Route 206 Center, Princeton, N.J. 08540.

Partition Monitor 'Boosted'

FAIRFIELD, N.J. — The Boost package from Macro 4, Inc. has been described as a partition monitor because it incorporates a method of sharing CPU power between DOS/VS partitions by setting a limit on the amount of continuous CPU time used by any one partition.

Partition monitoring, a continuous process that senses when a high-priority partition has become CPU-bound and is locking out other partitions, can change priorities dynamically to alleviate the blockage, a spokesman said.

This differs from time slicing, for example, which rotates partition priorities according to a preset time interval without considering the characteristics of the jobs, he explained.

Boost has been available for some time but several enhancements now make it more useful than ever, the spokesman continued, citing support for resident transients, a logical transient area (LTA) assist, priority I/O and an interrupt code optimizer as the areas of improvement.

Loading from disk is also greatly reduced and load time of material that must be moved from disk is "dramatically improved," he claimed.

The LTA Assist combines with partition monitoring and the resident transient feature to relieve the problems typically encountered by availability of only one LTA. The Assist gives the partition that has called a Transient top CPU priority until the LTA processing is completed.

The Interrupt Code Optimizer is of particular value to larger systems — with 30 or more devices attached locally.

The enhanced Boost is available for a total of $100/mo on a one-year lease plan, Macro 4 said from Gothic Plaza, 365 Hollywood Ave., Fairfield, N.J. 07006.

'Configurator' Aids DASD Users

SACRAMENTO, Calif. — Users of direct access storage devices (DASD) in IBM-based installations will not have to manually preallocate or reblock space on target devices when moving data sets if they use the Volume Configurator now available from Software Module Marketing (SMM), a spokesman said.

The Configurator system is an optional extension of SMM's DASD Management System (DMS/OS) and is able to provide significant support to users who are "migrating" Physical Sequential, Partition, Indexed Sequential and Direct Access data sets from one type of DASD to another.

Movement, reblocking and reallocation of data sets between various types of real and virtual DASDs is fully automated and under control of user-defined parameters with the Configurator, he said. It eliminates the need for track counting, address conversion and other clerical activities normally required when making such moves, he added.

Because of its reblocking ability, the Configurator does not restrict IBM 3850 mass storage users to certain device types when migrating in and out of the mass storage system.

The basic DMS/OS provides DASD reconfiguration, but requires that packs be dumped to tape prior to being restored to DASD. The Configurator eliminates the need to go to tape, the spokesman continued.

The Volume Configurator allows users the option of basing target allocations on tracks used, rather than tracks allocated for the source data set. The support also enables user programs to request the migration of individual data sets with optional renaming and reblocking with each use, he said.

The Configurator is available for $2,500; it requires the basic DMS/OS software, which costs $12,000, and can be ordered from SMM in the Crocker Bank Bldg. Penthouse, 1007 Seventh St., Sacramento, Calif. 95814.

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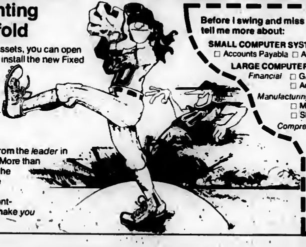

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Cobol Report Writer Practical in Most Uses

By Christopher K. Janisz
Special to CW

Cobol Report Writer has generally been considered a novelty, an elaborate toy unadaptable to the demands of the practical DP world. After five years and 10 installations (as an independent consultant), I have found the utility straightforward and flexible in almost all applications while providing an increase in maintainability and a reduction in software development time.

Report Writer functions are broken down into easily identifiable modules. Regardless of programmer style, modules always perform the same operation, in the same sequence, based on the same conditional branches. From the nature of the reserved words used, modules are somewhat self-documenting and little time is spent determining function.

Usually, the ease of report formatting is acknowledged as the utility's greatest advantage, but I find that its assignments of recognizable functional modules far outweigh any field positioning abilities.

Many people seem to feel Report Writer saves time on simple reporting, but becomes an unwieldy millstone with anything complex. The power of the utility lies not only in repetitive labels (headings, footings, details), but in automatically maintained totals.

Rather than branching and rebranching inside of programmer routines, standard maintenance tasks (updating, resetting, outputting) may be completely eliminated. I believe there is little disagreement with the reduction of programmer responsibilities as a basis for development time optimization.

As an illustration, consider the Cobol source code necessary to produce an inventory report of purchase order line items with the following requirements: all line items are to be summed by part number within department, by department and by division (Figure 1).

Assuming that all data has been sorted (by division, department, part), the logic necessary for the processing of each line item is diagrammed in Figure 2; this entire logic flow can be automatically constructed by Report Writer through little more than an initial description of report line formats (Figure 3), while execution code is reduced to a single GENERATE command.

Regulation of Scheduling

The most difficult concept to appreciate is the regulation of report module scheduling; perhaps the best means of explanation is by a walk-through. Execution of a GENERATE command initiates the following:

1. If the current line count is greater than the specified page limit, a page eject and the page heading are output and the line count is reset.
2. First time through, all CONTROL headings are output (updating line count and initiating all totals).
3. All CONTROL items are checked to see if their values have changed since the last GENERATE (a control break); if so, appropriate CONTROL FOOTINGS followed by CONTROL HEADINGS are output (updating the line count).
4. DETAIL items are output (if specified) and appropriate totals are summed.
5. Last time through (TERMINATE command), all CONTROL FOOTINGS are output.

CONTROL items are both boon and scourge to the applications programmer; when originally defined (eg., CONTROLS ARE CNT1, CNT2, CNT3) a hierarchical structure is identified. A control break on CNT3 would cause a CNT3 footing followed by a CNT3 heading to be output; however, a control break on CNT1 causes all lower level controls (in addition to itself) to breakproducing CNT3 footing, CNT2 footing, CNT1 footing, CNT1 heading, CNT2 heading, and CNT3 heading to be output.

To add to the complication, the example (Figure 3) uses subtotals (department and division) which, for efficiency, are only updated on the control breaks for those levels. No substitute for practical experience can be made here, but the unfamiliar user can easily learn manipulation of these modules by a top-down approach to code development (implementing and testing one module at a time).

Unfortunately, the business programmer may find little time for the learning process, but if structured design concepts and top-down development are adhered to, the initial trial-and-error time loss should be minimal. Certainly, experienced programmers may balk at "abandoning" their own personal methods, but consider the additional time, code and documentation necessary for programmer replacement of the automatic functions.

Report Writer is a powerful utility and, while avoided by analysts in general, is nevertheless an indispensable tool to the data processor.

Janisz is a DPer living in Royal Oak, Mich.

```
DIVISION A1

DEPARTMENT       PART       QUANTITY    VALUE
   TRNP      A73-4601-A       1854    27717.30
   TRNP      A76-4601-B       1071    16525.53
   TRNP      A89-76308        0045     5570.10
             * TOTAL *        2970    49812.93

DEPARTMENT       PART       QUANTITY    VALUE
   DIST      SF-964           1416   114401.68
   DIST      WC-895           0033       53.79
             * TOTAL *        1449   114455.47
             ______________________________________
DIVISION TOTAL VALUE:                164268.40
```

Figure 1

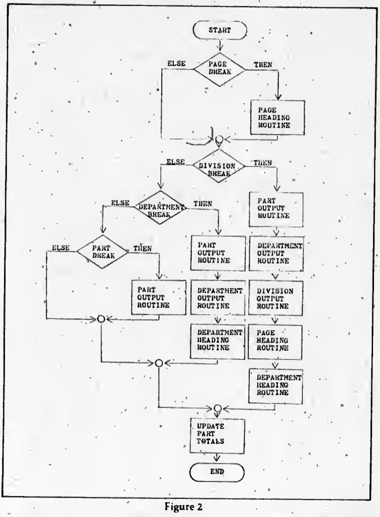

Figure 2

```
000390 REPORT SECTION.
000400 RD   PART-SUMMARY
000410      CONTROLS DIVIZION, DEPARTMENT, PART-NAME
000420      PAGE 60 LINES
000430      FIRST DETAIL 6.
000440 01   TYPE PAGE HEADING.
000450      05   LINE 01.
000460           10   COLUMN 22 PIC X(19)    VALUE   'PART SUMMARY REPORT'.
000470           10   COLUMN 51 PIC X(4)     VALUE   'PAGE'.
000480           10   COLUMN 56 PIC Z229     SOURCE  PAGE-COUNTER.
000490      05   LINF PLUS 01.
000500           10   COLUMN 22 PIC X(19)    VALUE   ALL '-'.
000510           10   COLUMN 51 PIC X(4)     VALUE   'DATE'.
000520           10   COLUMN 56 PIC X(8)     SOURCE  CURRENT-DATE.
000530      05   LINE PLUS 02.
000540           10   COLUMN 22 PIC X(8)     VALUE   'DIVISION'.
000550           10   COLUMN 31 PIC XX       SOURCE  DIVIZION.
000560 01   TYPE CONTROL HEADING DEPARTMENT LINE PLUS 02.
000570           10   COLUMN 22 PIC X(10)    VALUE   'DEPARTMENT'.
000580           10   COLUMN 37 PIC X(4)     VALUE   'PART'.
000590           10   COLUMN 45 PIC X(8)     VALUE   'QUANTITY'.
000600           10   COLUMN 56 PIC X(5)     VALUE   'VALUE'.
000610 01   PART-DETAIL TYPE DETAIL.
000620           10   SOURCE PART-QTY.
000630           10   SOURCE PART-TOTAL.
000640 01   TYPE CONTROL FOOTING PART-NAME LINE PLUS 01.
000650           10   COLUMN 25 PIC X(4)     SOURCE  DEPARTMENT.
000660           10   COLUMN 34 PIC X(10)    SOURCE  PART-NAME.
000670           10   QUAN-SUB
000680                COLUMN 47 PIC 9(4)     SUM     PART-QTY.
000690           10   VALU-SUB
000700                COLUMN 54 PIC Z(5)9.99 SUM     PART-TOTAL.
000710 01   TYPE CONTROL FOOTING DEPARTMENT LINE PLUS 01.
000720           10   COLUMN 34 PIC X(9)     VALUE   '* TOTAL *'.
000730           10   COLUMN 47 PIC 9(4)     SUM     QUAN-SUB.
000740           10   VALU-TOT
000750                COLUMN 54 PIC Z(5)9.99 SUM     VALU-SUB.
000760 01   TYPE CONTROL FOOTING DIVIZION.
000770      05   LINE PLUS 02.
000780           10   COLUMN 34 PIC X(29)    VALUE   ALL '-'.
000790      05   LINE PLUS 01.
000800           10   COLUMN 22 PIC X(22)    VALUE
000810                'DIVISION TOTAL VALUE:'.
000820           10   COLUMN 54 PIC Z(5)9.99 SUM     VALU-TOT.
```

Figure 3

Utility Produces Code on Series/1

E. PROVIDENCE, R.I. — A user-oriented program-generation package from Span Management Systems, Inc., SRPG/1 generates source-code programs on IBM Series/1 minicomputers with either 4955 A, B, C or D model processors operating under the Span TSS time-sharing operating system.

SRPG/1 is not a language, the firm explained, but a utility program that asks a series of user-answerable questions and generates a program to print data files from user specifications.

The software can produce single-line/record report programs with up to three user-defined detail headings and three user-defined optional report legends, a spokesman explained. The package also generates up to 15 report columns per print line and up to five optional report breaks.

Other features include variable page widths, print-line lengths and page lengths, as well as variable column spacing, the spokesman added.

SRPG/1 requires 64K of memory and costs $2,500 per machine. Span's time-sharing operating system (TSS), a prerequisite for SRPG/1, costs $5,000, the spokesman said from the company's Series/1 Division on Vision Blvd., E. Providence, R.I. 02914.

Repertoire of 30 Commands

Corporate Tax System Provided on Remote Net

LOS ANGELES — Corptax, a product of Financial Decision Systems, Inc. (FDS), is an on-line corporate tax system now available on the Interactive Data Corp. remote computing network.

With a repertoire of 30 commands, the system is said to provide a complete compliance service which prepares all corporate, state and local, combined, consolidated and separate income and franchise returns for multistate and multiunit corporations.

Data can be taken from the user's source documents from general ledger magnetic tapes or, presumably, disk-based files, eliminating the transfer of data onto input forms — a step that is recognized as error-prone, according to an FDS spokeswoman.

Trial balances, audit trails and adjustment worksheets are produced as initial output of the system. Adjustments, eliminations and information for the government's Schedule M are then entered through the terminal; tax calculations are made immediately and either the bottom line or final returns are produced, she noted.

Since the system is maintained in a central location, changes required by enactment of new laws or promulgation of new regulations can be implemented with relative ease by the vendor. Discussion of other changes takes place at a national, annual user group meeting, the spokeswoman said.

There is a $2,000 start-up fee for using Corptax, but after that normal Interactive Data Corp. rates apply, including a $35/mo minimum charge when applicable, she noted in conclusion from FDS's offices in Suite 1715, One Wilshire Blvd., Los Angeles, Calif. 90017.

'Autotab II' Now Includes Graphing, Display Abilities

PHOENIX — Capex Corp. has announced an enhancement to its Autotab II financial planning, forecasting and reporting system that is said to improve the software's flexibility in both commercial time-sharing and in-house environments.

Autotab II supports the DP novice as well as the experienced programmer in report preparation, a spokesman noted. The package provides all standard arithmetic functions (incuding square root and exponentiation) and related facilities such as summing, averaging and accumulating of specified fields, he said.

A "what-if" facility, also built in, simplifies evaluating sets of assumptions by reviewing up to 40 alternatives at one time, the spokesman added.

Release 4.0, like the previous version, is designed for use on IBM 360/370s operating in OS, VS and CMS environments.

The upgraded package incorporates a graphing facility capable of producing three types of histograms and generating any number of graphs in a single execution, according to the spokesman.

Autotab's restructured Call facility reportedly allows greater data transmission to and from Cobol or Fortran subroutines, and several other software additions are planned which will furnish the user with an extended range of depreciation, amortization and forecasting capabilities, the spokesman continued.

The package sells for a one-time fee of $14,450 or can be leased for $575/mo under an annual arrangement. Additional information on Release 4.0 is available from Capex at 2613 N. Third St., Phoenix, Ariz. 85004.

Dearborn Offers 'SIM-14' Update

PARK RIDGE, Ill. — Version 4 of SIM-14, the software package that allows programs developed on IBM 1401, 1440 and 1460 CPUs to run on state-of-the-art IBM or compatible hardware without reprogramming, has been released by Dearborn Co.

A Dearborn spokesman explained the rationale behind SIM-14. Users with second-generation programs can reprogram to run on the improved hardware now available, or they can use SIM-14. IBM 30 Series and compatible CPUs such as Control Data Corp.'s Omega 480, Itel Corp.'s AS/6 and Amdahl Corp.'s 470s simply do not contain emulation for 1400 Series programs.

SIM-14 not only supports code, probably written originally in SPS or Autocoder, but 1400 utilities and sort replacements as well, the spokesman said. The Dearborn package creates self-relocating problem programs and allows multiprogramming.

The Dearborn-provided environment supports all tape and disk devices including IBM 3350s and has no hardware restriction other than availability of the decimal arithmetic set.

SIM-14 costs $15,570 on a permanent license and monthly license plans are also available, the spokesman noted from Suite 400, 1460 Renaissance Drive, Park Ridge, Ill. 60068.

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'In-School' System Speeds Grade Reporting

By Tim Scannell
CW Staff

BROOKFIELD, Conn. — Being human, the average high school student doesn't look forward to getting a report card, especially if it includes bad news about his work. A local school's use of an in-house computerized grade reporting system makes academic scoring, if not a little less painful, at least a lot more timely than it has been in the past.

Brookfield Secondary School has approximately 1,350 pupils and until recently has relied on an outside service bureau to process each student's grades and determine academic standings. Teachers and school officials would fill out mark-sense cards indicating a student's academic progress, send the cards to the bureau to be processed and eventually receive a batch of completed report cards.

This relationship with the service bureau was fine, except it sometimes took more than 10 days from the time a student's grades were closed until the good or bad news was mailed from the school, James Chittum, dean of grades 8-10, stated.

Under the new system, grades, final reporting scores and even attendance records are processed by a Wang Laboratories, Inc. Model 2200 16K minicomputer purchased by the school's math department. "We increased the memory and added a high-speed printer . . . so that we actually bought more hardware in order to handle the in-house grade reporting system," Chittum explained.

The grade reporting software system, developed by Compleat Computer Solutions (CCS) handles a maximum of 1,500 students and maintains course files, instructor and student files, grade verification lists, quarterly ranks and up to four quarters of cumulative information. An optional attendance system, also developed by the firm, tracks absent/tardy figures and maintains student attendance information on a daily basis, a company spokesman said.

Besides reducing the average report turnaround time from almost two weeks to five or six working days, the system also allows more control over academic input. "We can have an edit or proof done as the cards come in and have the teachers immediately look for any errors they've made and change the cards before they're processed for reports," Chittum continued.

Number of Alterations

A number of alterations were made on the original software system both to improve its flexibility and to "shake out some of the bugs," Chittum noted. Programs were restructured to run faster and storage formats were rewitten to reduce the number of disk packs needed for a complete academic run. "CCS . . . squeezed things down in the file so that we got it all on two disks, whereas before we had to have a separate disk for each of the eight classes."

Brookfield also had a few minor difficulties handling the increased flood of mark-sense and punched cards. "We had been going with a card/computerized grade reporting system for three years before we started this one," Chittum continued, so the teachers had no problems dealing with the reporting method itself.

However, the teaching staff did have a hard time reading and marking the CSS cards, Chittum stated, "because they're used to writing on pieces of paper rather than on cards. Not only were the cards small, the color used for printing on them was hard to read "so we changed the color and shaded some columns to eliminate the problem."

Chittum observed that the entire system, including the software, hardware and various peripherals, is a "very expensive" proposition if approached from "scratch." In fact, he added, Brookfield probably would have voted against the present system if the school had not already purchased all of the hardware for instructional purposes.

The attendance and reporting software system, including installation, documentation and training, cost the school roughly $3,000, Chittum pointed out. "After this initial charge . . . the school merely pays for cards and paper plus . . . a clerk to run the system."

Since the software is tailor-made for the school's Wang configuration, the system has run virtually trouble-free, Chittum commented. "As it stands right now, the software has the capability of doing anything we want it to."

Print Utility Suits DOS/VS

ALTA LOMA, Calif. — Described as complementing the facilities of disk space allocation programs and improving the process of verifying test results, a utility package is now available from Efficiency Systems to print any data set in IBM DOS or DOS/VS.

With the software, any number of tape or disk data sets can be printed in a single execution, a spokesman said. The files can be sequential or indexed sequential on "any DOS/VS-supported device," he added.

Report data sets can be printed using embedded carriage control information, and records within a data set can be selectively printed. Each print control statement may be conditioned by up to eight record or range selections.

The utility runs in 32K, costs $500 and can be ordered from 8759 Hillside Road, Alta Loma, Calif. 91701.

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Meet to Focus On Data Banks

ALBUQUERQUE, N.M. – The Government-Industry Data Exchange Program (Gidep) has completed plans for a workshop on specialized data banks and communications network, to be held at the Four Seasons Motor Inn here Oct. 31-Nov. 2.

The session is intended for both government and industry representatives and will include seminars on Gidep data banks, computer and microform data retrieval equipment and techniques, and an orientation for new participants. The workshop is free to Gidep members; more information is available from the Gidep Operations Center, Corona, Calif. 91720.

Keeping Users in Mind

Documentation Requires Detail

By Richard Zaneski
Special to CW

A successful operations department needs current and well-organized program documentation. Without it, operators and DP staff personnel lose sight of many details essential to a successful computer operation.

Concepts and Techniques

Detailed program documentation has become vital with the advent of more sophisticated software and hardware. DP managers must recognize this fact and change their philosophies.

To initiate a meaningful documentation program, DP managers must select professionals who are technically competent and able to write clearly. In most cases, these people will face a complex, time-consuming and exasperating job. The end result, however, will be well worth the effort, if enough planning and research is done. The writer's initial task requires the preparation of documentation standards on a programming level. Formalized standards will establish the basic writing format and documentation complexity.

When writing program documentation, consider the needs of the personnel using the material. It should be geared for operators in the machine room and written at their level of use. However, it can be a valuable tool for the programming staff and new personnel in understanding programs and their relationship to each other.

In addition, consider the computer environment. All program documentation must reflect the operating system environment.

If the machine room operates in IBM's DOS environment, for example, prepare individual program write-ups in three sections. The first section should contain the following data:

- **Program function.** Write a functional description of the program. For example: "This program produces the trial balance report and updates the accepted transactions file.
- **Input file identification.** List all files that enter the program.
- **Output file identification.** List all files the program produces.
- **Input/output file identification.** List all files, such as work or sort files, that service the program.
- **Output report identification.** List all reports the program generates.
- **Run frequency.** Indicate the program's frequency. For example: "This program is run on the 15th of the month."
- **Program logic narrative.** Describe the actual program logic flow. The description should contain enough detail to help a programmer or operator understand the processing cycle.
- **Control card formats.** Show any control card data using a tabular format. Column headings must include the first and last column numbers of each field, fields lengths and field descriptions that include all possible code values.

The second section of the DOS program write-up provides more specific data for an operator, as follows:

- **Core required.** Show the amount of core the program uses.
- **Estimated run time.** Indicate the approximate program run time.
- **File use.** List each file and its logical identification.

Additional information should include the file status (whether it is input, output or I/O) and the device type used (such as tape or disk).

- Printer type. If reports are printed, note the type of printer used.
- **Carriage tape/forms.** List any special carriage tape and form. If normal computer paper is used, indicate the number of copies that will be printed. For example:

1. Fargo long carriage tape.
2. Standard three-part (11-in. by 14-in.) stock form.

- Console messages and action required. List all messages exactly as they appear on the console. Adjacent to each message, provide any corrective action that must be performed. If no messages appear, indicate this fact.

Third Section

The third section of a DOS program write-up contaihs the program flowchart and most current job control language. As a general rule, show the source and destination of each file on the flowchart.

Ensure that all file, report and program names are consistent with the program documentation text. The basic precaution establishes a continu-

(Continued on Page 40)

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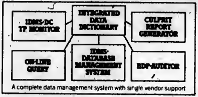

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Transaction Applications Backed

NEW YORK — An outgrowth of the Decision Strategy Corp. Terminal Application Processing System, the Taps Transaction Processor (TTP) from Decision is said to be a "complete environment for developing transaction-based applications" that can be used on IBM 360/370s or a variety of microcomputers.

Users build transactions interactively from a CRT — screens are laid out, transaction controls specified and data bases described through the keyboard. TTP provides security, menus, editing, temporary data storage, data collection, network and data base recovery, a spokesman said.

The system also supports data paging, documentation, terminal operator control and accumulation of statistics, he said, adding that users need only code for logical comparisons and computations.

TTP interfaces with any communications monitor or provides its own. It also interfaces with "all terminal types," he continued. The code, written in a high-level language, is "90+% portable" amongst IBM mainframes and minis from Digital Equipment Corp., Hewlett-Packard Co., Interdata, Tandem Computers, Inc. and IBM, he said.

TTP is available for $25,000, with discounts applicable for multiple installations within the same organizations. The vendor is at 708 Third Ave., New York, N.Y. 10017.

Good Documentation Needs Detailed, Orderly Approach

(Continued from Page 38)

ity between individual program write-ups and assists personnel in working with the program.

If documentation is geared for an OS environment, observe all steps used in preparing DOS program write-ups. However, ensure that the second section of the OS program write-up contains the following changes:

- In place of the "file use section" and its associated information, list each DDNAME (data description card name) and DSNAME (data set name). Adjacent to the DSNAME, indicate the unit type involved and its disposition.
- In place of the "carriage tape/forms section," identify the carriage tape/-forms control buffer. Normally the forms control buffer takes the place of a carriage tape for a high-speed printer. It is part of the control unit that serves as an interface between the system and printer.

If a low-speed printer is used, the carriage tape will be used and should be identified.

- The printer type should not be shown.
- If any console messages appear, list them.

After Completion

After completing a DOS or OS program write-up, number each page (Page 1 of 4, Page 2 of 4 and so on). Odd-numbered pages must have the page number typed in the lower right-hand corner. Even-numbered pages must have the page number typed in the lower left-hand corner.

After all principal users approve the program write-up, copies of the pages can be encased in protective plastic sheets using a back-to-back configuration. In this manner, page numbers will appear by the outer margin of the pages.

At this point, all program write-ups can be placed in individual binders by system in their operational sequence. In turn, each documented system must have a table of contents and list of effective pages. These introductory pages must show the program names in their proper order, number of pages in each program write-up and change numbers with approval dates, if applicable.

Even with slightly different requirements, each DOS or OS program write-up must be a self-contained unit reflecting all operational needs. This modular approach provides an efficient means of maintaining the program documentation and making the writer's job easier.

Packages Aimed At APL Uses

TORONTO — Numetrix Ltd. has released two application packages designed to run under most APL implementations including VSAPL and APL SV for IBM equipment and APL running on Digital Equipment Corp. and Hewlett-Packard Co. machines.

The first package, Conversational Terminal Input (CTI), was designed as a standard utility to handle all prompting transactions between an APL program and its user, a spokesman said. CTI reportedly supplies user-oriented code for man-machine interaction and reduces the effort required for applications consisting of conversational I/O.

The second package, Analyst, is appropriate for any user who needs to extract data from a data base, manipulate the data and print the results utilizing a flexible report generator.

CTI can be leased for $100/mo for the first year, after which no further charges are made, and Analyst is available for $300/mo for the first two years with no added charges, the spokesman said from Suite 600, 3 Church St., Toronto, Ont., Canada M5E 1M2.

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Mixes Circuit, Packet Switching

Japanese Show Off Interuniversity Net

By Ronald A. Frank
CW Staff

KYOTO, Japan — An on-line demonstration of an experimental interuniversity communications network was provided for delegates to the recent International Conference on Computer Communication, with simulations of time-sharing and remote job entry (RJE) services.

The demonstration was conducted at Kyoto University, where the experimental N-1 network has been undergoing field trials since mid-1976. The N-1 network links Kyoto University's DP center with the DP center at Tokyo University using facilities that will become part of the DDX-2 switched digital data network being configured by the Nippon Telegraph and Telephone Co.

The field trials are testing the feasibility of linking seven University computer centers in Japan by using both circuit-switched and packet-switched lines that will be part of the DDX-2 network.

Long-haul facilities in the N-1 network include 48K bit/sec lines connecting a Facom M-190 mainframe at the Kyoto University DP center with a Hitac 8800/8700 CPU at Tokyo University supplied by Hitachi Ltd.

Circuit-switched facilities are used for load leveling, RJE, file transfers and real-time processing. The packet-switched lines are used for time-sharing, on-line file access and other interactive uses, according to Hajime Kitagawa, associate professor of DP at the Kyoto University installation.

Network Details

About 130 remote terminals at Kyoto and 350 at Tokyo are connected to the N-1 network. Terminal control at Kyoto is handled by Facom F2805 communications control processors, described as similar to the IBM 3705 front end.

Time-sharing terminals operate at 50-, 300- and 1,200 bit/sec while remote batching stations transmit at speeds ranging from 1,200- to 9,600 bit/sec.

Several CCITT-standard protocols are employed in the network; the packet-switched service utilizes the X.25 standard. A Network Virtual Terminal (NVT) protocol is used which includes functions similar to those of the U.S. Arpanet and Telenet Service.

The Facom M-190 uses the OSIV/F4 operating system, described by Kitagawa as similar in capabilities to IBM's MVS. The mainframe includes 6M bytes of main memory along with a cache memory of 16K bytes.

The machine is faster than a comparable IBM, 370/168 and is about equal to an Amdahl Corp. 470 mainframe, Kitagawa said.

Unusual Printer Site

The Kyoto Center has an unusual output printer installation. It includes four high-speed printers operating at speeds up to 2,000 line/min.

Output jobs are run through an automatic paper cutter that separates the printout from the continuous form paper and carries it to a conveyor belt. From there it is carried to a rotating carousel, resembling the devices found in baggage claim areas of airports, from which graduate students and other users collect their completed printouts.

Among the N-1 network services shown during the demonstration were the TSS time-sharing service. The Tool-IR information retrieval service and RJE capabilities that provide self-service input to authorized users.

Optimization Service Designed To Lop 30% Off Telephone Bills

By Brad Schultz
CW Staff

CAMBRIDGE, Mass. — A service designed for firms whose annual telephone bills exceed $200,000 reportedly cuts those bills 30% and enhances telecommunications management.

The service "provides the ability to report on all telephone calls from each extension, [noting] their cost and to whom they are made," according to a spokesmen for the vendor, Index Systems, Inc.

From a detailed "telephone bill" generated for each extension, management has an accounting of the number, length and cost of all calls and whether they were business-related, he explained.

Other reports show expenses by division, department and company totals, "with all information for determining quickly if costs are reasonable and within [the] budget."

"One of the key benefits of the service is that it gives a company the tools to ensure the most cost-effective network for its particular needs," the spokesman said.

Special reports identify heavy calling areas and the potential of Wats, Tie and Foreign Exchange (FX) lines. "This data is run through an optimizer [at the Index facility] which determines...the best combination of lines, available features and grade of service from a standpoint of cost and usage," he noted.

The optimization methodology consists of three steps: call pricing, cost/savings comparison and truck activity/savings. After these steps are completed, the possible combinations of Wats/FX/Tie circuits are determined through Cobol programs Index has developed and runs on a time-shared IBM, 370 configuration.

Three Steps

In call pricing, "all Wats and private line calls in the input data base are priced out as if they had been originally carried on the Direct Distance Dialing [DDD] network," the spokesman explained. "This step places all calls on a common footing so parametric analyses of savings comparisons performed in later steps can be realistic and accurate."

Index maintains a file of the location of each of the 35,000 Bell System rate centers in the U.S. This file, together with programs utilizing Bell System distance calculation algorithms and both inter- and intrastate message pricing tariffs, yield the DDD prices for each call.

During the cost/savings comparison step, the priced-out traffic parcels are entered recursively into a series of statistical programs which construct and evaluate a range of Wats configurations. "The overall systems evaluation of the output of these programs is accomplished by Index consultants," the

(Continued on Page 42)

Is DES Best Net Security?

Much controversy has surrounded the development and implementation of the federal Data Encryption Standard (DES).

Proponents say it is the premier form of data protection for both commercial and government network applications; its critics claim the standard is vulnerable to penetration in certain environments. Some have even charged that the IBM-developed and National Security Agency-sanctioned algorithm has been rigged for clandestine access and thus poses a privacy threat [CW, Jan. 30].

Computerworld is planning a series of articles on this controversy and wants to know what you think about the DES. Send your opinions to Brad Schultz, *Computerworld*, 797 Washington St., Newton, Mass. 02160. Requests for anonymity will be honored.

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Graphics Terminal Features Refreshed Display

NEEDHAM HEIGHTS, Mass. — The Imlac Corp. Dynagraphic Series Model 3205 interactive graphics terminal features refreshed display, software support for host CPU and terminal and a choice of light pen or joystick.

The terminal's support software in conjunction with an optional host/terminal Fortran library can allow users to generate and interact effectively with complex graphic/-alphanumeric displays, employing Fortran calls for applications, Imlac said.

The Dynagraphic terminal is compatible with host CPUs such as the Prime Computer, Inc. 500, Data General Corp. Nova and Digital Equipment Corp. PDP-11, the firm said.

The Model 3205 is said to permit modification or partial erasure of images during interaction without a need for redrawing the entire picture, as required with storage tube systems.

The Model 3205 comes with 16K words of semiconductor memory, a 19-in. refreshed image CRT and a 92-key keyboard with 16 lighted function keys. Dual processors in the unit provide dedicated support for both the CRT and user interaction, respectively.

The terminal costs $14,750, Imlac said from 150 A St., Needham Heights, Mass. 02194.

Service Reduces Telephone Bills

(Continued from Page 41)

spokesman said. "The cost/-savings comparisons developed at each stage must be analyzed manually to select a set of configurations that merit further analysis.

The final optimization step consists of computerized call-by-call simulations of each of the near-optimal Wats configurations and alternate trunking rules discovered in the preceding step. The trunk activity/savings procedure is said to eliminate any errors introduced by statistical approximation.

"We can determine exactly what the trunk activity and consequent savings would have been if each test solution had actually been implemented during the study period," according to the spokesman. "The communications consultant again enters the scene at this stage because the least expensive solution is not always the best one. This 'sensitivity' yields a solution that will be relatively stable in a specific client's environment," he said.

Mini Vantage

According to Index Systems, many companies do not fully appreciate the latest technological advances in telecommunications and the expanding number of sources for switching, station and control equipment. In particular, the firm noted, solid-state equipment based on minicomputers can now provide "more efficient and versatile capabilities at lower cost."

Aside from the IBM, 370-based optimization software, Index employs an inhouse Digital Equipment Corp. PDP-11/70 with a 128K-word memory, Basic Plus, Fortram and the RSTS/E operating system.

Current users of the service include Citibank, Bank of America and the First National Bank of Chicago, Index Systems said.

The service cost cannot be generalized since it depends on each client's specific environment, the firm noted. To date, fees have reportedly ranged from $5,000 to $150,000.

Index Systems is at One Broadway, Cambridge, Mass. 02142.

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Portable Terminal/Scanner Works Over Phone

CEDAR RAPIDS, Iowa — A hand-held microprocessor-controlled terminal designed to provide a two-way link with host CPUs has been introduced by Norand Corp.

The Norand 101 is programmable to allow tailoring according to user needs. The device, which includes a wand scanner, can use any telephone to communicate with a central CPU, extending managerial control into the field, according to a Norand spokesman.

The Norand 101 employs a keyboard of 20 keys and rechargeable batteries to guide the operator through program sequences.

For Most Mainframes

The device is said to be suitable for most mainframes and to provide error-free transmission. It can receive as well as transmit data with its solid-state memory ranging from 16K to 64K characters.

The Norand 101 measures 1.53- by 3.34- by 7.22 in.; the complete terminal, including batteries, memory and communications adapter (battery charger), weighs about 1 lb 6 oz.

The standard unit features 2K (8-bit) bytes of programmable read-only memory (Prom) and 16K (4-bit) bytes of random-access memory. Six two-position switches are featured for program control and two switches effect power on/off.

The interface's 15-pin connector is said to conform to EIA standards for the connection of external devices such as adapters.

Battery Life

The removable, rechargeable batteries have an operation life of about 10 hours and require a recharge time of five hours, the spokesman said. Reliability is rated at 2,500 hours mean time before failure, he added.

The Norand 101 transmits data at 1,200 bit/sec in simplex mode with reverse channel, error-correction capability and optional auto-answer.

Alternately, it can function in half-duplex transmit/-receive mode at 1,200 bit/sec with integral battery charger and optional auto-answer. The acoustic coupler functions in simplex mode at 300 bit/sec.

The single-quantity price of the Norand 101 is $1,150. In quantities of 25 to 50, it costs $1,095 per unit; orders of 51 to 100 units cost $1,020 each; 101- to 500-unit orders cost $990 each; orders of more than 500 units cost $890 each.

Optional scanning gear for bar coding reading is available with 2K of Prom for $600, Norand said from 550 Second St. S.E., Cedar Rapids, Iowa 52402.

Processor Links CPUs, Terminals To TWX, Telex

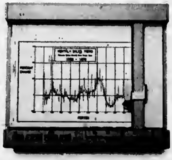
CLIFTON, N.J. — High-speed mainframes and terminals can communicate with the low-speed TWX and Telex networks using Utec Corp.'s Microline communications processor.

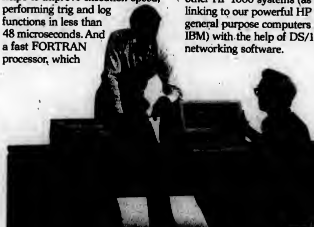
Interface conversion is provided between an RS-232 port and the Telex line adapter or TWX access arrangement supplied by Western Union Telegraph Co.

The Microline performs automatic dialing and call routines. Its buffer memory compensates for speed differences, Utec said, allowing the RS-232 device to converse in 8-level Ascii code at 110 bit/-sec with the Telex network, which uses the 5-level Baudot code at 50 bit/sec.

Character expansion is generated where needed in order to make the two codes interchangeable, a spokesman noted.

The Telex-compatible version of Microline costs $3,000 while the TWX-compatible version costs $3,750, the firm said from 871 Allwood Road, Clifton, N.J. 07012.





Most engineers and scientists will find all the power they need in this new leader of the HP 1000 family. A new floating point processor handles big data arrays and cuts lengthy computational problems down to size. And the HP 1000 Model 45 also has the flexibility for complex measurement and control applications, for data base management and distributed networking.

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A special scientific instruction set, standard in the system, also helps to improve execution speed, performing trig and log functions in less than 48 microseconds. And a fast FORTRAN processor, which handles commonly used FORTRAN operations in hardware, also gets things done in a hurry.

Our RTE-IV real-time operating system, the latest in an upward compatible family, lets you manipulate data arrays up to 1.8M bytes, using simple FORTRAN commands. As many as 64 partitions, with a program capacity of 54K bytes, can be resident in memory at the same time.

The HP 1000 Model 45 comes with a fast (25 msec seek time) 20M byte disc drive and an HP 2648A Graphics Terminal, as well as our new Graphics/1000 support software to help you write graphics programs. You can also team it up with other HP products like the HP 9872A four-color plotter and the HP 7245A printer/plotter.

Adding data base management is as simple and economical as adding peripherals. Our IMAGE/1000 software will consolidate your technical information into related and easily accessible files. And you can pool data from other HP 1000 systems (as well as linking to our powerful HP 3000 general purpose computers and IBM) with the help of DS/1000 networking software.

In addition to getting graphic displays on the 2648A terminal, you can get hard copy graphics on our new 9872A programmable four-color plotter, one of many options available with the HP 1000 Model 45. It has a built-in microprocessor and operates up to 360 mm/s (14 inches/s) on each axis. Ideal for vector analysis trace differentiations and window plotting.

So if you've got some big jobs to do, but don't have a big budget to match, the HP 1000 Model 45 can solve your problems fast. To find out all about it, call the HP office listed in the White Pages. Or send us the coupon. We'll prove once again that good things do come in small packages.

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Telemetry Meeting Planned

SARASOTA, Fla. — The International Foundation for Telemetering will hold the 1978 International Telemetry Conference in Los Angeles Nov. 14-16. The conference theme will be "Expanding Frontiers of Telemetry and Telecommunications."

A variety of product exhibits, talks and technical sessions will be featured, including a keynote address by Dr. Neil Burch of the Office of the Secretary of Defense.

Admission to all events and a copy of the conference proceedings are covered by the $50 general registration fee. Admission to student technical sessions without receipt of the proceedings costs $7.50, while admission to any or all tutorial sessions costs $10. There is no charge for attending the exhibits, and lunch with the keynote address is available free to the first 200 registrants.

Further information on the conference at the Hyatt House Hotel near Los Angeles International Airport is available from Shelby Bass, EMR Telemetry, P.O. Box 3041, Sarasota, Fla 33578.

System Aids Net Configuration

BETHESDA, Md. — Scientific Time-Sharing Corp.'s Aries circuit optimizing system is said to facilitate the configuring of private-line networks by identifying which cities are zoned.

"Not only is it [normally] hard to tell which zones of a zoned city a circuit involves, but there are also special rules that apply," a company source explained.

"Under AT&T's Multischedule Private-Line Tariff for voice-grade interstate lines, a two-point circuit involving a zoned city is priced first by measuring the mileage between Zone 1 of the zoned city and the other point in the circuit. If the mileage is more than 40 miles, the circuit is priced from Zone 1. Otherwise, the circuit will be priced from the zone in which the circuit terminates."

But using Aries, these difficulties are resolved, the source said. Zoned cities are identified by entering an area code/exchange — for example, 301-657 — or a city name — such as PHILADELPHIA/3,PA.

Aries will configure any circuit involving a zoned city to take into account any special rules, the source said.

Typical Aries circuits cost $6, the firm noted, pointing out that further information is available from Robert Ellis of Scientific Time-Sharing Corp., 7316 Wisconsin Ave., Bethesda, Md. 20014.

Paper Dissects U.S. Policy

CAMBRIDGE, Mass. — Just where does the U.S. stand with regard to the international communication of information?

The title of a just-released paper on that subject — "Rethinking International Communications" by William Read — suggests that U.S. policy is due for reevaluation.

The paper is said to identify a set of leading policy problems "in which more is at stake than just the parochial interests of [communications] producers and suppliers." Three leading elements of what might be called "information relations" are reportedly identified as satellites, news and know-how.

The 19-page paper costs $23.40 from the Harvard University Program on Information Resources Policy, 200 Aiken, Cambrige, Mass. 02138.

ECR Designed For Retailers

MAYNARD, Mass. — An electronic cash register (ECR) designed specifically for small retailers and large chain retailers who need a basic ECR for various in-store departments has been introduced here by Data Terminal Systems, Inc. (DTS).

The microprocessor-controlled unit, designated the Model 150, features 4K read-only memory and 64 random-access memory locations, the company said.

The Model 150 reportedly offers optional backup battery operation, validation printing to cancel checks automatically, automatic tax calculation and the ability to provide 15 totals including up to six merchandise departments.

The ECR costs $795 from DTS at 124 Acton St., Maynard, Mass. 01754.

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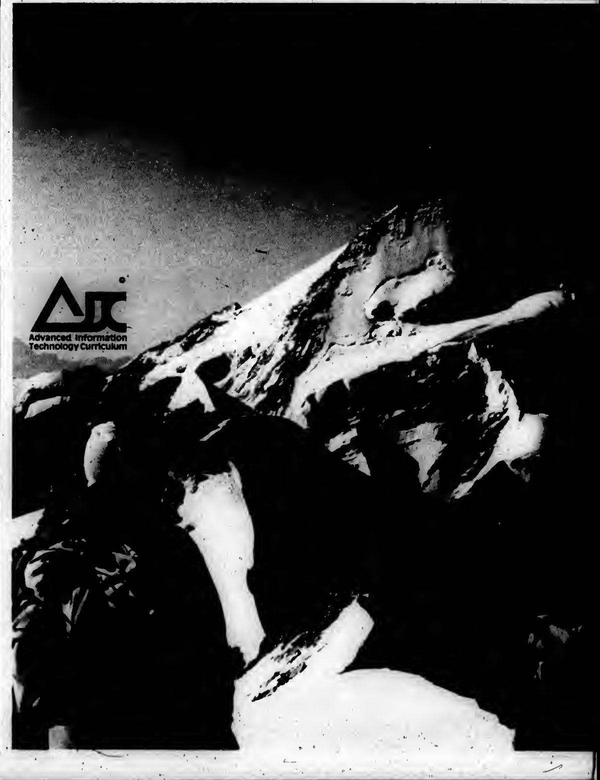

Graphic Sciences Introduces Facsimile Network

DANBURY, Conn. — The Graphic Sciences, Inc. Dexnet facsimile network includes the Dex 4000 automatic send-and-receive family and two recently developed facsimile transceivers, the Dex 1100 series and the Dex 5100 series of digital transceivers.

The Dex 1100 series includes two-; three-, four- and six-minute analog machines compatible with AM, FM and CCITT standards while the Dex 5100 offers a downward (analog) compatibility option and meets the CCITT standards, according to a spokesman.

"High-volume users can place Dex 5100 transceivers strategically to cut line costs . . . and use analog equipment like the Dex 1100 series in remote, low-volume locations," he suggested.

The Dex 5100 can send a full page of text in 20 sec, the spokesman said. Standard features on this model include modular, microprocessor-controlled architecture and automatic document feed.

Option 1

Option 1 features include automatic dialing and poll-and-receive from an internal memory that stores 200 telephone numbers, a simultaneous send-and-receive capability, a 9,600 bit/sec modem and compatibility with two- and three-minute Dex AM and three-minute CCITT analog devices.

Transmissions can reportedly be made at 65-, 98- or 196 line/in. over voice-grade lines.

The Dex 1100 series is microprocessor-controlled to allow communications with Dex AM, CCITT AM, industry-standard FM and with the Dex 5100 digital transceiver, the spokesman said.

The Dex 1102 and 1103 provide vertical resolutions of 88 line/in. at 3 min/page and 62 line/in. at 2 min/page in the Dex AM modes; and 96 line/in. at 4 min/page in the FM mode.

FM Mode

The Dex 1101 was designed to operate at 96 line/in. at 6 min/page and 64 line/in. at 4 min/page in the FM mode.

The Dex 1102 and 1103 are capable of transmissions in less than two minutes. Reduced line charges result from standard features including bidirectional editing indexes, automatic electronic handshake and operator interrupt, the spokesman maintained.

The basic, table top 1101 model sells for $2,200 and rents for $62/mo, which includes maintenance. The Dex 5100 can be purchased for $12,000 or rented for $300/mo on a one-year contract.

The Model 5100's auto-dial option costs $1,500 or $30/mo on rental; the model's compatibility feature costs $3,000 or rents for $60/mo. The full-duplex option costs $1,000 or $20/mo and the 9,600 bit/sec modem is priced at $2,000 or $40/mo on rental.

Graphic Sciences, a Burroughs Corp. subsidiary, is located at Corporate Drive, Commerce Park, Danbury, Conn. 06810.

Spectron Offers Printer/Monitor

MOORESTOWN, N.J. — The Spectron Corp. D-201 printer/monitor reportedly can be teamed with the vendor's Datascope D-5-1B/502B printer to deliver hard copy of data originally sent at speeds up to 100k bit/sec using virtually any line discipline.

The D-201 prints Hex, Ascii, Ebcdic and other codes at up to 900 char./sec, Spectron said, adding asynchronous lines can be monitored at any transmission rate up to 9,600 bit/sec.

Also compatible with Spectron's D-601 Datascope printer, the D-201 can function as a stand-alone, hard-copy line monitor providing simplex and half-duplex operation, a spokesman noted.

Printing is accomplished by an electrosensitive rotary-head printer with three removable cartridge print heads, each consisting of a 7-element stylus. The print heads are motor-driven at a constant speed, and the 120° spacing of the print heads places each one in contact with the paper at all times, according to the spokesman.

The paper is fed under the print heads, which are sequentially pulsed to form the appropriate characters. The printer mechanism is slide-mounted for access to paper and motor drives.

The RS-232C-connected D-201 weighs less than 28 lbs and draws approximately 240W of 115/230 Vac power at 50 to 60 Hz.

The D-201 costs $4,500; additional character codes cost another $600 to $800 each. Options include a slide rack mounting adapter for $220, an RS-232C interface for $240, a 20/60mA current-loop interface for $135 and a current-loop interface — polar and neutral to 9,600 bit/sec — for $240.

Spectron Corp. is at 344 New Albany Road, Moorestown, N.J. 08057.

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Fiber Optics Couplers Unveiled

TORONTO — Fiber optics directional couplers that allow bidirectional information transmission on a single optical fiber are available from Canstar Communications.

Canstar directional couplers in models TC4-A, -B and -C are offered in a range of coupling ratios and are designed to serve as both taps and feeds in fiber optics systems.

Used as taps, the couplers serve to divide the optical power in a single channel and to distribute it among one or more secondary channels, a Canstar source said. For instance, they permit the attachment of several computer terminals to a single data bus for multidrop systems.

As feeds, the couplers can be used to feed signals from one channel into another to merge channels to or from an optical source.

Model TC4 couplers have four I/O ports. Light entering through any port is cross-coupled to both fibers on the opposite side. These couplers incur insertion losses of well below 1 decibel to provide directivity of greater than 40 decibels, Canstar said.

The couplers are packaged for industrial and telecommunications applications. Standard models are said to be supplied with fiber pigtails or may be ordered with integral fiber optics connectors.

These couplers can accommodate upcoming high-volume, low-cost commercial applications such as community antenna TV, according to a Canstar spokesman.

Since the design permits the introduction of high-quantity manufacturing economies, "fiber optics couplers are no longer complex multicomponent laboratory curiosities," the spokesman said, adding "they can now be confidently engineered into communications and data networks with the realistic expectation of consistent performance and future cost savings."

All TC4 models are available for a variety of glass and plastic clad step index and graded index fibers. For optimal system design, the index profile of the coupler's I/O cable must be matched to that of the system fiber chosen, the vendor source said.

The couplers cost $200 with quantity discounts available, the firm said from 1240 Ellesmere Road, Scarborough, Ontario, Canada M1P2X4.

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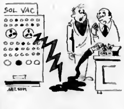
System Teaches Keyboard Users

ELK GROVE VILLAGE, Ill. — The Advanced Systems, Inc. Keytrainer audio/visual training system is a set of software programs intended to assist both experienced and new keyboard operators who use remote, teller and point-of-sale terminals for programming, word processing or data entry.

Already employed in Europe, the system is able to increase productivity by as much as 20% and to lower the frequency of errors by up to 50%, its developers claim.

Keytrainer is said to provide self-paced skills training with an easy-to-operate audio/-visual unit that features 35 mm filmstrips with synchronized sound.

The set of programs costs $5,500, Advanced Systems said from 1601 Tonne Road, Elk Grove Village, Ill. 60007.



'Sol Vac Has Its Own Way of Handling Petty Cash Dippers,'

TMA Elects Officers

PITTSBURGH, Pa. — The Telecommunications Management Association (TMA) has inaugurated the following individuals as elected officers:

- Delbert Henry of National Steel Corp., president.
- William A. Barton of Gulf Oil Corp., first vice-president.
- John Hill of Aluminum Co. of America, second vice-president.
- James R. Avoli of L.B. Foster Co., secretary.
- T. Richard Moore of Fisher Scientific Co., treasurer.
- Wil Schomburg of Bessemer & Lake Erie Railroad Co., director.
- Howard Hess of Universal Cyclops, director.
- Virginia Ritson of Lord Corp., director.

TMA meetings are held on the first Wednesday of each month, September through May. Programs include presentations by vendors, panel discussions by competing vendors, member round-table discussions and field trips to vendor installations.

Additional information is available from John Hill, Aluminum Co. of America, 1501 Alcoa Building, Pittsburgh, Pa. 15219.

Harvard Studies Focusing On Telecommunications

CAMBRIDGE, Mass. — The Harvard University Program on Information Resources Policy has announced research efforts in the area of telecommunications industry competition and regulation.

David J. Seipp of the program will survey developments in the regulatory and judicial arenas since the first consideration of a competitive domestic common carrier application in 1969. Primarily concerned with domestic specialized common carriers, Seipp will investigate analogous experiences in resale and sharing services, international telecommunications, domestic satellites, terminal equipment and the boundary between the telecommunications and computer industries.

A second project undertaken by Harvard's Irwin Bupp and Alan Jakimo will explore recent developments in telecommunications regulation in light of the regulatory and competitive environment of the telecommunications and computer industries.

The first objective of this project is to write a series of about 10 related case studies for use in a course on manufacturing policy at Harvard's Graduate School of Business Administration next year. Plans include two case studies of semiconductor/integrated circuit design and manufacturing; two case studies of computer design, manufacturing and marketing; one or more studies of "interconnect equipment"; and several manufacturing aspects of coming "smart" telephones.

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List Contains 'Musts' of OCR Selection

By Dennis L. Sullivan
Special to CW

Users considering the purchase or installation of optical character recognition (OCR) equipment are faced with a multitude of choices. Following are some suggested guidelines.

- Conversion costs. The two prevailing concepts in the OCR marketplace are the "unit" idea, which involves upgrading or enhancing existing equipment, and the "system" concept, which requires the acquisition of a new system. Since the cost of acquiring a whole new system is considerable, it is clearly a major factor to consider.
- Throughput rate. All manufacturers of OCR equipment rate their equipment. A prospective user or purchaser should take time to send sample documents to a potential supplier for testing. In addition, first-hand observation and demonstrations can almost always be arranged by a vendor.
- Payback. Financial aspects of OCR equipment purchase should not be overlooked. Payback is dependent on total system cost, operating costs and throughput rates. Most reliable OCR manufacturers will work with you in this area to analyze your financial projections.
- Total system cost. Several trade-offs are possible when buying OCR gear. For example, one system might cost $100,000 and process 10,000 document/hour, while four smaller $25,000 systems might have an aggregate rate of 8,000 document/hour.

Although the smaller systems would require four operators and throughput would be somewhat lower, a purchaser would not be susceptible to total system failure.

- Equipment flexibility. This is an important area, given the nature of printed characters on documents. Among the considerations here are whether the read head can be adjusted to scan different locations on the document (and if so, how easily), how many lines of data the equipment can acommodate and the number of different fonts the system can recognize. In addition, a prospective user should ask how readily different fonts can be selected.
- Operator acceptance. Input from operators can be valuable, since they actually use the equipment and may have an outlook different from management. The best system is useless if operators will not or cannot adjust to a new methodology or technology.
- Delivery schedules. These are obviously important. A company's inability to deliver within a reasonable length of time could raise red flags in other areas. Another consideration relevant to delivery schedule problems is replacement parts availability. What is the company's track record on making such parts available?
- Equipment reliability. In order to get a representative sample of user experience with the equipment, several vendor-supplied references should be checked.
- Manufacturer credibility. A manufacturer's experience in equipment production and

(Continued on Page 50)

Insurance Company's IBM 3033 First of Its Kind in Midwest

By a CW Staff Writer

CHICAGO — Promise of an early delivery date for an IBM 3033 central processor persuaded Zurich-American Insurance Companies here to forego plans to add one or more attached processors to its heavily overtaxed 370/158 installation.

Zurich-American's 3033, a first-day order, was installed June 30. Anthony Studin, vice-president of data services, said IBM engineers "did a fine job of getting the system up." The CPU was delivered on a Monday and was ready to be turned over to the insurance company by late Thursday, he said.

The processor, which represents an investment of $3.3 million, is the first of its kind installed in the Midwest, according to Studin. The insurance company executive speculated IBM sent in a "very good team" to make a good impression with this early installation.

Zurich-American has used the system to put four of its 24 field offices on-line and expects to have all of them on-line eventually, he said. The four offices are connected to the 3033 over leased lines operating at a combination of 4,800- and 9,600 bit/sec.

By the end of this year, Studin said, the company will have an on-line network of 80 Courier Corp. 2770 terminals.

The system is used during the day for on-line entry and validation of insurance policies as well as for system testing, with evening shifts handling the company's batch work. The system is operating 24 hours a day, seven days a week, with the DP staff divided into three daily shifts.

The installation includes an IBM 3705 communications controller, four 3350 disk drives, high-speed tape drives, two 3211 printers and a Dataproducts Corp. 1,200 line/min printer connected throgh a Paradyne Corp. channel extender.

'Stable System'

Studin said Zurich-American's 3033 configuration is "a stable system" and credited careful planning with IBM representatives for the smooth transition from the 370/158. "In all my experience with changing com-

(Continued on Page 54)

RJE Data Entry System Helps Wheel Maker Roll Out Data

By Howard A. Karten
CW Staff

LITTLE ROCK, Ark. — When bicycling suddenly increased in popularity several years ago, it brought not only increased sales to the Wheel Goods Division of AMF, Inc. here, but a paper tiger as well.

The company found the increased paperwork that accompanied its business expansion caused delays in the delivery of paychecks, invoices and other important items.

The division, which manufactures and distributes AMF bicycles and accessories, had battled — successfully — with the paper tiger before, when it replaced its keypunch equipment with a key-to-disk System 1300 manufactured by Inforex, Inc.

"The high humidity of the Little Rock area always presented a problem with punch cards," according to Gene Kwasny, operations manager for the division.

So the company replaced the keypunches with key-to-disk units and, for a while, it was pleased with the result.

"When we first installed the System 1300 and eliminated our punched card operations, we were pleased with the improved controls and efficiency," Kwasny said. "We enjoyed the System 1300's reliability and ease of operation, but our volume suddenly skyrocketed and, consequently, we needed more sophisticated communications abilities to generate our payroll and invoicing reports on schedule."

Using IBM 2780 data transmission equipment, the company was sending more than 40 inventory, order and personnel reports each day to division headquarters in Olney, Ill. The sudden increase in volume that accompanied the rise in business led to delays in generating invoices and personnel reports.

These backlogs peaked at month's end, when the delivery of paychecks to Litte Rock usually fell behind schedule.

"Because we were batching all the data in

(Continued on Page 48)

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Contract Course Upcoming

NEW YORK — Brandon Consulting Group, Inc. will conduct an intensive, three-day course in computer contract negotiation here Nov. 13-15.

The company said the course is designed for managers with responsibility for preparing or signing contracts, for financial officers and for attorneys and other professionals responsible for preparing and negotiating DP contracts.

The $650 course fee includes a copy of a book on the subject written by two of the course instructors, selected copies of *Computer Negotiation Reports*, reference materials and a luncheon each day. Instructors will be the sponsoring firm's president, Dick Brandon; Sidney Segelstein, a partner with the law firm of Goldstein & Schrank; and Joseph Auer, president of International Computer Negotiations.

Preregistration is required. Additional information is available from Ruth Dargis, Brandon Consulting Group, Inc., 505 Park Ave., New York, N.Y. 10022.

'Scaled-Down' Sycor 400 Version Aimed At Low-Volume Data Entry

ANN ARBOR, Mich. — Sycor, Inc. has added a lower end system to its recently introduced 400 family of distributed processing systems (DPS).

The Sycor 404, a scaled-down version of the larger units in the series, features 48,000 bytes of main memory, a 12-in., 2,000-char. CRT, 50,000 bytes of flexible disk storage and a bidirectional Sprinter printer.

A spokesman for the company said the system was designed for users at remote sites with low-volume data entry needs that do not require more than one CRT station.

The system can process two separate jobs concurrently, the spokesman said, adding that the unit offers IBM's Binary Synchronous Control (BSC) and Synchronous Data Link Control (SDLC) communications protocols with speeds up to 9,600 bit/sec and asynchronous communications up to 1,200 bit/sec.

Three languages are available on the system: Cobol, Basic and Sycor's terminal Application Language (TAL) 2000. TAL 2000 is said to serve as a common bond between Sycor products and to have been designed for users who need a language specifically for "intelligent data entry programming."

A typically configured Sycor 404 with 48,000 bytes of memory, 500,000 bytes of flexible disk storage, a CRT, printer and communications adapter sells for $10,535, a spokesman said from 100 Phoenix Drive, Ann Arbor, Mich. 48104.

Smart RJE Data Entry System Helps Wheel Maker Roll Along

(Continued from Page 47)

the evening, response time was getting very slow," according to Jack Moninger, DP manager at the division's Olney headquarters. "As a result, getting invoices out on time was a hassle and . . . the payroll department barely had enough time to get the checks out."

To meet this transmission problem, the company began investigating several alternatives to batching and transmitting the data. These options centered on providing on-line transmission capabilities to division headquarters.

Although AMF investigated the equipment offered by several vendors, it settled on an Inforex System 1303 intelligent remote job entry (RJE) data entry system with four workstations.

"We checked out Mohawk Data Sciences Corp. and a few other vendors but continued to work mainly with Inforex. We decided to stay with the company because [we felt that] it was the only vendor that could put together a data entry and communications package in a short time, Kwasny said.

Several Benefits

The System 1303 provided the company with several benefits: the storage capacity of the system tripled; the data compression and double buffering features of the system allowed the company to make better use of its communications lines and the Job Control Language (JCL) function of the system enabled terminal operators to change job queue priorities, according to Kwasny. This meant "hot jobs," such as the payroll, could be processed immediately.

As a result, daily personnel and inventory reports are generated up to six hours earlier than before, and applications were added to the company's on-line system.

"Previously, once the job transmission queues were set for the day, they could not be changed," Monninger said. "Now operators can easily set up a remote transmission, and a priority job such as payroll can be transmitted as soon as the data entry work is done, instead of at the end of the day."

This six hour average time savings in report generation is largely a result of the system's ability to transmit directly from disk, the use of a high-speed line printer and the increase in line speed from 2,400- to 9,600 bit/sec, Kwasny explained.

"Previously we could not get those reports to Little Rock until the middle of the afternoon, so we have in effect eliminated a one-day delay in report generation because the operators usually did not work on them until the following morning," he recalled.

In addition to decreasing turnaround time and being able to print hot jobs immediately, AMF's materials requirements planning program, which is used to forecast inventory needs over a long-term basis, was put on-line to the system.

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College Increases Fortran Throughput 16-Fold

By Howard A. Karten
CW Staff

WORCESTER, Mass. — A Digital Equipment Corp. VAX 11/780 installed here recently by the College of the Holy Cross reportedly runs Fortran programs 16 times faster than the school's previous system, an IBM 370/125.

Thor Olson, director of DP for the college, said the VAX 11/780 delivers this performance without the floating point accelerator available on the system. With the addition of this feature, which the school is currently considering, he estimates the system's performance could double.

Olson said the school decided to buy the system when it became apparent the 370 was becoming overloaded. That system, which was used for both academic and administrative tasks, will continue to be used solely for administrative work, while the VAX 11/780 will be dedicated to academic and research work.

"We looked at several alternatives, including a larger IBM system and offloading some of the work onto another system. However, IBM doesn't provide much in the way of time-sharing for academic users that was within our budget.

"We needed a machine that could run large Fortran programs well and that had a time-sharing ability. The only such product available from IBM was VM, we felt, but the price of the system was too high — it was overkill," Olson continued. "Also, we were looking for something easy to use for the casual user. Most of our users run canned Fortran programs, so the VAX seemed a better choice for that application."

College officials said the VAX system will support a combination of CRTs, printers and special I/O devices to be used for interactive processing of instructional and research-oriented activities.

Approximatley 25% to 30% of the statistical packages have already been converted, Olson said, adding that the process of moving users from the older IBM system to the VAX will continue for the next few months.

The system will be used by faculty and students in the departments of economics, sociology, psychology, political science and history. It will also perform high-computation and simulation programs for the mathematics, chemistry and physics departments and will support a music laboratory.

In addition to these ambitious plans, the school is also considering implementing computer-assisted instruction (CAI) in several areas.

The configuration presently in use includes 1M byte of memory, 352K bytes of disk storage, a magnetic tape subsystem and a communications interface for 16 lines. The principal language will be Fortran-IV Plus, with Basic and VAX-11 Macro Assembly Language. All programs will run under the VAX/VMS operating system.

Although it has only been running for a few months, the experience thus far has been gratifying to college officials. "Performance has been very good so far, and we feel this will provide us with a pathway to the future," Olson concluded.

Auerbach Offers Reference Aid

PENNSAUKEN, N.J. — Auerbach Publishers, Inc. has announced the availability of *Dataworld*, a four-volume reference service covering the most common and actively marketed U.S. and international DP systems.

The service, which will be updated monthly, will contain in-depth coverage of general-purpose DP systems including plug-compatible processors, small business computers, minicomputers, peripherals, data handling, system support software, data communications, terminals, peripherals, applications software and other subjects, the company said.

Included in the service will be in-depth tutorials examining applications within each industry segment; comparison charts presenting specifications and characteristics of equipment; product reports providing analysis and users' reactions; pricing data; and how-to management tutorials offering practical methods of applying the technology discussed.

Dataworld will cost $425 through 1978 and $485 thereafter. A 30-day free trial period and additional information are available from Auerbach at Department PR, 6560 N. Park Drive, Pennsauken, N.J. 08109.

List Details OCR 'Musts'

(Continued from Page 47)

the financial stability of a vendor are important when buying equipment. In particular, a manufacturer experienced in solving manufacturing and maintenance problems and well-versed in product development offers much expertise to equipment purchasers.

• Vendor support. In this regard, make sure the vendor is financially stable and will support its equipment. It never hurts to get a client list.

There are reasonably priced, effective OCR systems available on the market, but it takes a lot of effort to choose one for your company.

Sullivan is a consultant to Key Tronic Corp. of Spokane, Wash.

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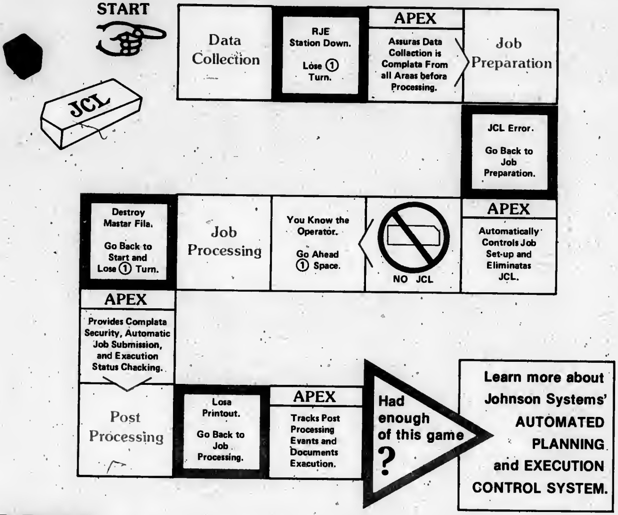

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Distribution Problems Eased

Order Entry System Spreads Benefits for User

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TOLEDO, Ohio — Can a computer system, unlike a man, be all things to all people?

An order processing system installed two years ago at the DeVilbiss Co. may come close. George R. Huston, manager of distribution operations, likes the way the system smooths the distribution cycle for the company while it saves time, trouble and money. Richard Wahl, head of the company's management information systems (MIS) recognizes the system's contribution to both field flexibility and home office control.

And Dino Lioi, manager of one of the company's regional distribution centers, is impressed with its customer service support.

"In our business, effective distribution is vital," Huston pointed out. "If we cannot deliver the item the customer wants when he wants it, we risk losing a sale. Ready availability of line items at the six regional distribution centers across the country and a high level of customer service are critically important.

Speed is essential to turn orders around for delivery. The system gives us a big assist, sharply reducing the number of costly, customer-annoying, time-consuming order errors," Huston explained.

The DeVilbiss Co. manufactures and markets paint finishing equipment and related products. It serves the automotive, appliance and furniture industries as well as professional auto body shops and painting contractors with its own direct sales force and a national network of after-market and industrial distributors.

About 8,000 items are carried within the company's broad product line, with an autonomous Health Care Division manufacturing respiratory equipment for professional and home use.

Each of the company's six distribution centers stocks about 4,000 line items. The Toledo master distribution center is responsible for resupplying the regional centers as needed, and stocks the company's entire product line.

To service this operation, the company uses an IBM 370/135 which runs under DOS/VS. The 320K-byte system communicates with IBM 3741 Model 4 intelligent terminals at the distribution centers over dial-up lines.

The terminals are a refinement of a product distribution and customer service system that has been undergoing a major revamping during the past three years. The sweeping upgrade program has led to the creation of an individual distribution department within the DeVilbiss marketing organization and the consolidation of 11 distribution facilities into a network of six regional distribution centers, including the master center here.

Reorganization Plan

A basic move in the DeVilbiss reorganization of product distribution and customer service operations was to decentralize customer order entry by shifting the responsibility for this function from headquarters to the field facilities.

"Initially," Huston explained, "we utilized a conventional system for this, involving punch paper tape units at each regional distribution center. This proved inadequate since order processing was too slow and we had a high error rate in the punched paper tape data transmissions between the regional centers and headquarters.

"We needed something better for both on-site order processing and remote data communications," he recalled.

The order entry system solved both these problems for the company. After a preliminary manual edit, orders now go to the distribution center's terminal operator who enters the customer's number, then sees an immediate display of the customer's name and address on the terminal screen.

This visually validates customer identification and also eliminates the former time-consuming search for a customer card in an index file.

The terminal unit automatically assigns a sequential invoice number and guides the operator through entry one step at a time. As the operator keys in order data, the terminal simultaneously records the order document and stores order data on a diskette.

After the oprator enters the order item and quantities (an average of five line items per order), the system adds up the total and displays it as another visual check.

Completing Order Entry

Order entry is completed after the terminal operator keys in any special instructions, such as prepayment, ship complete or partial shipment acceptable plus shipping charge amounts for any COD orders.

Full order details are stored, in entry sequence, on the diskette record.

The printed order document serves as both pick list and a shipping label. This is a turnaround document that comes back to the terminal operator after the order is picked and shipped.

When it is returned to the operator, he keys in the customer and invoice

(Continued on Page 53)

What to do for a DBMS headache.

A look at data base management systems in our October 30th Special Report.

Getting the right information to the right people at the right time can create tough problems in any large DP system. And the increased bulk of associated information that DP systems handle means a need for more efficiency, capability, and responsiveness.

Data base management systems — the heralded, but controversial solution to increased systems complexity — is the subject of our October 30th *Computerworld* Special Report. Edited by Don Leavitt, *Data Base Management Systems* will be examining many of the uncertainties about DBMS which make it difficult for the planner to determine whether it suits his needs. We'll have stories from users themselves; telling you how they have utilized DBMS, as well as words to the wise on DBMS "overkill". We'll have tips, pointers, and in-depth reviews on evaluating, selecting, applying, and trouble-shooting DBMS, including topics like:

- *The impact of new DBMS on an organization: who "owns'" the data? Who's responsible for its accuracy? Who can use it?*
- *Using DBMS on minicomputers [and even micros].*
- *Relational systems: How they're doing in the real world.*
- *The future of DBMS.*

If you currently use DBMS software, or are planning to buy, this Special Report will be of special interest to you. And if you market DBMS, you'll reach a wide end-user audience here. Ad closing date is October 13th, and your *Computerworld* representative can give you full ad planning assistance. Or, to reserve space for your ad, call Terry Williams at 965-5800.

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Switching Power Supply Handles 130 Watts

SUNNYVALE, Calif. — A quad-output switching power supply from Boschert, Inc. is said to provide users with 130 watts of power at 60% to 70% efficiency.

The OL-130 continuous power from each output at levels is a four-output unit that can supply +5V at 15A, -5V at 2A, +12V at 4A and -12V at 2A.

Input voltage on the unit is user-selectable at 115V or 230V strappable, the company said. The unit can accept inputs from 95V to 130V for the 115V input and 190V to 260V for the 230V option.

The unit is said to provide 16 msec of continuous full output power in the event of an input line voltage loss; an optional power failure detect circuit can provide a TTL signal suitable to initiate data transfer, according to a spokesman.

Standard features on the unit include an EMI filter, reverse voltage protection, a series thermistor that reduces line surges at turn-on and short-circuit protection.

The OL-30 costs $193 in quantities of 100, the company said from 384 Santa Trinita Ave., Sunnyvale, Calif. 94086.

Honeywell Users Planning Phoenix Forum This Month

PHOENIX — The Honeywell Large Systems Users Association (HLSUA) will hold its 27th annual Forum meeting here Oct. 15-18.

Forum will offer workshops, seminars and lectures on 65 different topics by Honeywell, Inc. and HLSUA representatives in a three-day program organized by the association's applications, installations, systems, languages and utility software committees.

Among the subjects scheduled are improvements in Gcos operating system, an overview of Level 66 hardware/software, the Level 6 distributed systems environment and a Fortran update.

Also planned are presentations on converting from Honeywell's IDS/I data base management system to IDS/II and on enhancements to the company's DM-IV and Universal File Access System.

The Forum keynote address will be delivered at the Monday morning general session by Russell G. Henderson, vice-president and general manager of Honeywell's U.S. computer marketing operations.

Additional information is available from Ron Miller of Honeywell at P.O. Box 6000, Phoenix, Ariz. 85005.

Order Entry System Pleases All Users

(Continued from Page 52)

numbers. If the order has been shipped completely, this is the only information the operator need enter. If there has been a discrepancy in the physical inventory, that information must be entered as well. Otherwise, out-of-stock items are "prebackordered."

Entry Completion

The operator completes the shipment transaction entry by keying in the carrier and bill of lading numbers as well as the shipping date. All shipment-related data is recorded; again in order number sequence, on a separate diskette.

After the close of the day's business at the distribution center, information on both diskettes is transmitted to headquarters over dial-up phone lines. The 370/135 at headquarters readies the data for processing against the master record files.

"We use the data from the distribution centers to update customer and item master sales records and to adjust individual distribution center inventory status records to reflect the day's shipments," Dick Wahl, MIS manager, explained.

"And if the day's shipments have dropped any inventory item below a preset minimum stock for the particular distribution center, the computer automatically initiates a replenishment stock shipment to that center, which will go out on the next resupply truck from the master distribution center in Toledo."

Billing Input

Order shipment data from the regional centers also becomes input to the centralized customer billing routine at headquarters. "Billings go out at night," Wahl pointed out, "so we're not only turning incoming orders around for delivery within 24 hours, but we're also getting the invoice into the mail within 24 hours of order receipt.

"The improvement in our cash flow that results from the timeliness and accuracy of the customer billings is substantial. We estimate the system has reduced the number of data errors that delay billings by more than 85%."

DeVilbiss installed the 3741 terminals one at a time at the distribution centers, with the first installation at the Cleveland center back in 1974. "Conversion from the old paper tape system was smooth and problem-free," Huston said.

"The terminal is easy to operate so several office employees at the distribution centers can handle the order entry function. The system has proven very reliable, is already fully cost-justified and helps to make distribution operations efficient," he added.

UPS Works At 20 kVA

NUTLEY, N.J. — A 20 kVA uninterruptable power supply (UPS) recently introduced by Nova Electric Manufacturing Co. is said to provide voltage regulation to within 1% and frequency regulation to within .5%.

Standard features on the unit include frequency and phase synchronization, output voltages of 120V and 240V, output frequencies of 50Hz and 60 Hz and a distortion of less than 5% total harmonic distortion (THD).

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Add-on Helps Utility Boost Evening Throughput 40%

BRIDGEPORT, Conn. — The installation of additional memory and a disk subsystem on an IBM 370/135 at a local gas distributor here has helped the company increase throughput 40% on its evening production shift.

The Southern Connecticut Gas Co.'s 125,000 customers are handled by two divisions within the company. Before adding the additional memory and disk, the billing was performed in two runs, one right after the other, but with the additional equipment, the two jobs run concurrently.

The system also has increased responsiveness to customer needs, according to James P. Healy, the utility's vice-president of management services. For example, under the old system when a customer's payment arrived after his monthly billing cycle had passed, the transaction could not be posted until the following month. If the customer called during the interim, the representative would check through a weekly list of all such "off-cycle" transactions. This time-consuming procedure often required a call back.

In contrast, the system now prints out daily "off-cycle" lists so that queries can be answered while the customer is on the telephone. Southern Connecticut Gas is currently moving toward a real-time system in which queries will be keyed into terminals for immediate on-line access to records.

"Our system had the potential to do more, but it lacked sufficient real memory and external disk capacity," Healy recalled. This showed up in a high paging rate and the inability to run an adequate number of jobs concurrently.

To solve the problem, the company invited several vendors, including IBM, Itel Corp. and Memorex Corp., to bid on add-on memory. References from another local company as well as price considerations helped persuade the company to choose a Memorex 6400 memory system with 368K of memory and two Ampex Corp. 3675 disk drive modules.

"Installation of the add-on was uneventful — it was completed over a weekend," Healy said. "It took longer to install the disk units because the changeover involved some modifications of our software packages, but Memorex personnel were very cooperative and instrumental in resolving the problems."

Although the installation experienced some minor problems at first, which Healy termed "just small wrinkles," he reported that no real problems had been experienced with either system.

The added memory has enabled the company to get into on-line programming, using an IBM program product called Entry Time-Sharing System (ETSS). Healy explained that ETSS was a kind of "scaled-down version" of TSO, which usually runs on larger systems under MVS.

Routine commercial applications, including inventory control, work measurement, accounts payable, payroll and records management, are handled during the day shift. At night, the computer batch processes customer accounts and bills. The billing operations are accomplished at an average 40% time savings.

"The system has been very stable since installation last fall," Healy said. "Our customers receive more prompt service, while our staff is pleased with the increased flexibility and throughput."

Docutel Unveils Upgrade Of TT 300 Teller Terminal

DALLAS — Docutel Corp. has introduced an upgraded version of its TT 300 automated teller terminal that it says will permit existing Docutel customers to protect their investment in Docutel equipment for coming years.

The TT 2300 is described as a redesigned version of the TT 300 and fits in the same space as the TT 300s. The unit is said to feature state-of-the-art technology and be two to three times more reliable than the old machine. In addition, the system can now handle increased volume, a spokesman said.

Features include an expandable memory that allows the system to continue functioning if the host goes down; a capacity of 4,400 new bills in a two-denomination dispenser, a larger printing capacity than its predecessor and maximum memory size of 32K words. The cost of supplies for the system to process 50,000 transactions is approximately $80, the company said.

The basic TT 2300 costs about $27,000, according to Docutel, and a field upgrade from a TT 300 starts at $12,000. The company is located at P.O. Box 222306, Dallas, Texas 75222.

Company's 3033 a 'First'

(Continued from Page 47)

puters," he said, "if you work properly with IBM there is no problem in getting these things installed with a minimum of hassle."

The insurance company's DP staff of 87 persons, including six systems programmers, was also able to make a fairly smooth conversion from a VS1 to an MVS operating system for the new CPU, according to Studin.

The old system, he said, was "saturated to the point we were being hampered," whereas the 3033 system has "plenty of CPU power."

However, he said, with MVS and the additional demands of increasing on-line capabilities, the system is "constrained until we get more memory on it." Studin said the company expects to add 2M- to 4M bytes of Intel Corp. memory within the next two months.

As the system grows, he added, the need for a contingency plan to cover long-term interruption of service becomes more necessary.

Decstation Systems Gain Three Levels

MAYNARD, Mass. — Digital Equipment Corp. has added three levels of Decstation business systems — the 78 and two 88 series levels — aimed both at first-time users and users who want to upgrade.

"A small number of our customers, such as law and accounting firms and small wholesalers, have the 78 series machine and now want to expand," a DEC spokesman said. Users can now process disks from several 78 series machines at a centralized 88 model, he noted.

The machines announced were the Decstation 78/50, an entry-level system for standalone use in a small business environment; three mid-level Decstation 88 models, which permit system expansion and provide a link to the low-end 78 model; and the upper level Decstation 88/90 for large data base applications.

The systems include more standard software, particularly the COS-310 commercial operating system and the general-purpose OS/78 operating system. High-level languages supported include Dibol, DEC's business-oriented language, commercial Basic and Fortran IV.

Decstation 88/50

The Decstations employ DEC's latest disk storage technology, according to the spokesman. The Decstation incorporates the VT78 CRT terminal and the RX02 double-density floppy disk drive; the Decstation 88s employ the VT100 terminal, a PDP-8/A processor, an RX02 floppy disk drive and an RL01 disk pack drive, the company said.

Each of the three Decstation 88 models incorporates a PDP-8/A processor with 32K words of memory, the VT100 CRT terminal and a choice of mass storage devices in cabinets designed for office environments.

The three mid-level models are the 88/50, 88/70 and 88/80. The 88/50 has two floppy disk drives and includes licenses for OS/78 and COS-310. The 88/70 is the same configuration with four drives.

The Decstation 88/80 includes two floppy drives and a 5M-byte RL01 disk drive; it can

(Continued on Page 56)

Adventists Make Conversion From System/3 to Wang Mini

GLENDALE, Calif. — The Southern California Conference of Seventh-Day Adventists has undergone a conversion of the computer kind. The group, the second largest conference of Adventists in North America, converted in July from an IBM System/3 Model 8 to a Wang Laboratories, Inc. 128K-byte CPU.

"I'm really satisfied, to date, with the equipment," Carl F. Friday, DP chief for the Southern California Conference, said.

The purchased Wang VS system, which includes a 220 line/min 2263V printer, two 75M-byte disk drives and six CRTs, has 30 times the storage capacity of the System/3.

The additional storage is crucial because of the 10 different applications on the church conference runs. Besides handling standard payroll and 32,000-item general ledger operations, the conference acts as a service bureau for six Seventh-Day Adventist local congregations. The goal is to extend this local church service to as many as 25 churches, Friday said.

The DP shop also processes the Adventists' medical program, donations, payables, associated reports and membership directories, which can be printed for local churches directly from computer output.

The Southern Conference is one of six conferences in its union, and eventually all the conferences will have Wang computers linked together, Friday noted.

Running a church today is a complicated business, particularly in Southern California, which has the highest concentration of Adventists anywhere. There are approximately 33,000 Adventists in the counties of Los Angeles, Santa Barbara and Ventura,

(Continued on Page 60)

Fastest Execution Claimed

Fortran VII, 8/32 Packaged

OCEANPORT, N.J. — Perkin Elmer Corp.'s Interdata Division is offering two systems that combine its Model 8/32 Megamini and associated peripherals with the globally optimizing Fortran VII programming language introduced in July.

The Fortran VII-based systems allow users to develop and execute application programs at higher speeds than minicomputer systems which do not use Fortran VII, according to the firm.

For example, the Fortran VII 8/32 system can perform a table-handling binary search of a 40K-byte array in 26 sec, almost one-fifth the speed of competing Fortran systems, Interdata said. Fortran VII programs can be compiled at speeds of more than 1,500 source line/min, a spokesman added.

The two systems include the Interdata Model 8/32 Megamini, one with 512K bytes of main memory and the other with a 768K-byte main memory storage capacity. The smaller system has a 10M-byte disk while the larger system uses a 67M-byte disk and the Fortran enhancement package with 2K writable control store.

Features available on both Fortran VII systems include high-speed floating-point hardware, 800 bit/in. magnetic tape, the OS32MT multitasking operating system, Common Assembly Language (CAL) macro, a carousel console, system diagnostics and documentation.

The systems feature automatic job control, which allows Fortran programs to be com-

(Continued on Page 58)

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CDC Expands Line, Cuts Prices of IBM Units

MINNEAPOLIS — Control Data Corp. has announced a larger fixed-disk subsystem in its Certainty Series of mini-peripherals and terminals for users of the IBM Series/1 minicomputer.

At the same time, the company lowered prices an average of 20% on a number of its other Series/1-compatible peripherals that were announced in June.

The Certainty 230 Model 30 fixed media device provides a formatted storage capacity of 63.2 million bytes of data. The subsystem includes disk drive, LSI single-board controller, diagnostics and the interconnections needed for use with the IBM Series/1.

Other units in the Certainty 230 family provide storage capacities of 9.3 million and 19.7 million data bytes.

For users designing systems that incorporate both fixed and movable disk drives, the Certainty 230 series is fully compatible with the company's previously announced Certainty 270 series of removable media storage module drives, the firm said.

Both series have identical data formats, transfer rates and disk track capacities so users can exchange information between the two types of drives to meet their requirements, a spokesman noted.

The product is aimed at sophisticated end users with very large installations; prices are geared to quantity purchasing, the spokesman said.

End users can purchase the Model 30 subsystem in quantities of 100 units for under $8,000 each. For 10 to 24 units, the price is $9,590 and includes all hardware, software, diagnostics, installation and a 90-day warranty on parts and labor. Maintenance is available for $48/mo. Initial customer deliveries currently are scheduled for the second quarter of 1979.

CDC also announced a price cut for other disk and band printer products in its line of Series/1-compatible mini-peripherals.

Thirty-three percent comes off the price of the Certainty 270 series of storage module disk subsystems. That makes the 63 million-byte 270-10 disk — at the low end — $12,430 in quantities of 10 to 24 and the 240 million-byte 270-30 subsystem at the high end $26,590 in the same quantities.

In quantities of 100, those prices drop to less than $10,000 and just under $23,000, respectively.

The price of the Model 450-10 band printer (360 line/min) in quantities of 10 to 24 has been dropped to $9,900 and the 720 line/min Model 450-20 — has been dropped to $13,650, respectively.

In quantities of 100, those prices are $9,200 and $12,700, respectively.

Stations Get Three Levels

(Continued from Page 55)

transfer data between smaller Decstations and large ones because files can be transferred between the floppy and RL01 disks.

The largest Decstation introduced, the 88/90 series, consists of a PDP-8/A processor with two RL01 drives. The 88/97 model includes 64K words of memory.

Decstation 78/59 prices start at $8,250 in single-unit quantities from the Maynard, Mass. manufacturer. Decstation 88s range from $11,500 to $25,100.

Deliveries start in December.

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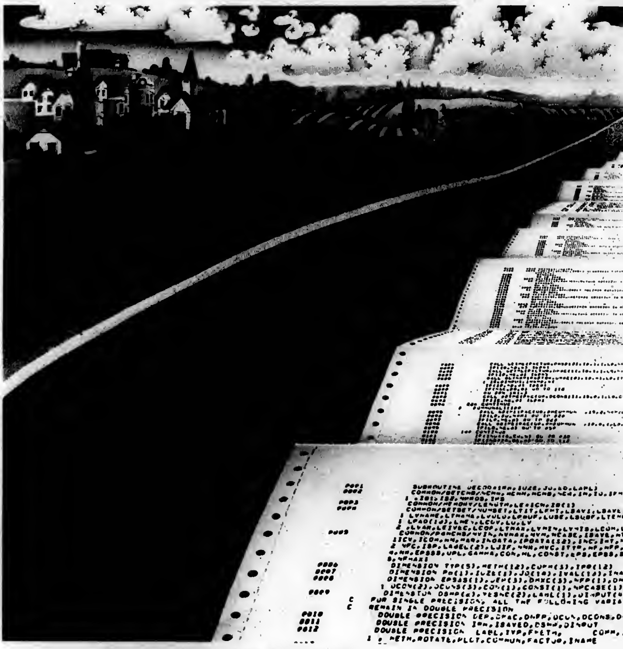

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VAX also offers ANSI 74 COBOL and full BASIC PLUS 2 to make it ideal

Distributed Processing System

Irrigator Flows to Mainframe via Small System

RIVERSIDE, Calif. — The Irrigation Division of Toro Co. here is using a small business computer for on-line as well as batch processing. The computer works in a distributed processing system with an IBM 370/145 located in the company's corporate headquarters in Minneapolis.

The Toro Irrigation Division manufactures sprinkler heads, automatic controllers and valves for use in golf course, commercial, agricultural and residential irrigation systems.

Before purchasing the Hewlett-Packard 3000 in November 1976, all data processing was done in batch mode by the 370 through a remote job entry (RJE) terminal in Riverside. But batch processing was insufficient, both in terms of speed and capability, for the division, which has had an accelerated growth rate over the last five years of 19%.

As a result, the division needed to develop its own dedicated, on-line systems.

Processing Mix

"We decided on the HP 3000," according to Emmet Rixford, manager of information systems, "because it had the best price/performance ratio of anything we could find. It allowed us whatever mix of RJE, local, batch and on-line processing we needed and offered us better vendor support than we believed we'd get anywhere else."

The division's various application programs had been running on the IBM 370/145 through an IBM 3780 RJE terminal. Since the HP 3000 was brought in-house, however, and the 3780 RJE terminal was eliminated, the Irrigation Division has been able to continue running the old programs by using the HP 3000's 2780/3780 emulator, which automatically converts the data into a form acceptable by the 370.

No program changes are necessary — only minor changes in the job control cards, Rixford noted. Processing results are sent back over leased lines to the small system in the form of print files.

The initial HP 3000 configuration consisted of a 256K-byte Series II processor, a 47M-byte disk, a 600 line/min printer, a 1,600 bit/in. tape, a card reader, a card reader/punch, five HP 2640B terminals and the HP 2640A operator's console. Additional terminals and a 50M-byte disk were added later.

The system uses the Image data base management system and Ksam with Cobol, Basic and RPG-II, as well as the Data Entry Language (DEL), an aid that allows programmers to design, create and modify terminal screens in any format.

Two On-Line Systems

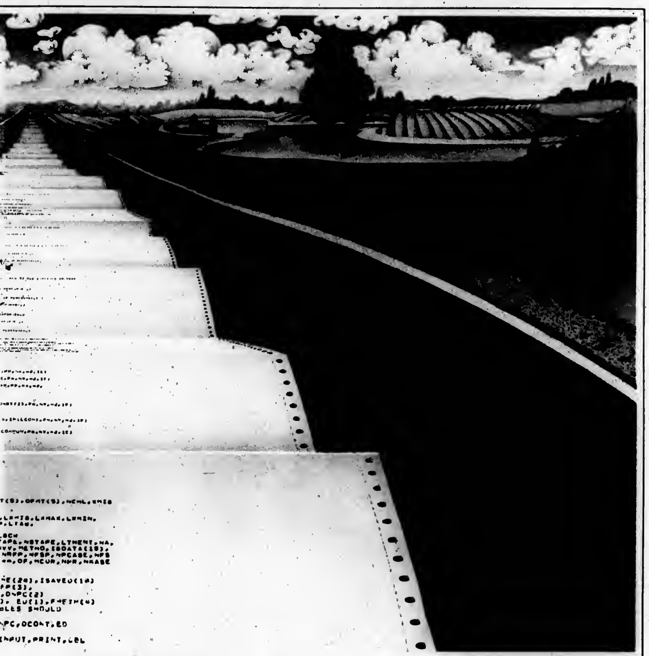
During the first year, while the production control and financial systems continued to be run on the 370 through the HP 2780/3780 emulator, the Irrigation Division developed two on-line systems: distribution and inventory.

The distribution system, which is sales-oriented, allows sales department personnel to generate a thoroughly edited sales order using an on-line terminal. Input errors are virtually eliminated, Rixford said.

Product substantiations and pricing are done automatically, as are customer acknowledgements, shipping papers and the updating of the open order file. When the goods are shipped to a customer, the shipping information comes back onto the system, and invoicing and any necessary back ordering take place.

The inventory system is used mainly by production control, warehousing and manufacturing. The system displays work-in-process and finished goods inventory status, which shows what is on the division's shelves; shop order and purchase order status, which tells what the division is building or purchasing; sales order status, which shows the current demand for the product; and stock status, which shows the historic de-

(Continued on Page 59)



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Disk Care Detailed

CHATSWORTH, Calif. — A guide to the care, cleaning and handling of disks and heads in Pertec Computer Corp. disk drives is available from the firm's Pertec Division.

Presented in four chapters are step-by-step instructions for the care and cleaning of disk drive heads and disks, recovery from head crashes and disk and head handling.

The 12-page booklet, tailored to the disk drive user who is not technically oriented, also includes suggested cleaning supplies, preventive maintenance directions and clarification of terminology.

Copies of "Care, Cleaning, and Handling of Disks and Heads for Pertec Disk Drives" are available from Pertec Computer Corp., Pertec Division, MS 40/04, 9600 Irondale Ave., Chatsworth, Calif. 91311.

Interdata 8/32 Gets Fortran VII

(Continued from Page 55)

piled, linked, loaded and executed with a single command, the firm said.

The Fortran VII 8/32 systems were designed for universities, government agencies, military and aerospace organizations or any Fortran user involved in scientific research, simulation, industrial automation or data acquisition, according to the spokesman.

Previously, Interdata's Model 8/32 megaminis were available with Fortran VI. Fortran VII "takes programs that have run on our 32-bit processors and executes them in half the time," the spokesman noted.

The Fortran VII 8/32 system with 512K bytes of main memory is priced at $89,900. The 768K-byte system costs $134,000 from the Interdata Division of Perkin Elmer at 2 Crescent Place, Oceanport, N.J. 07757.

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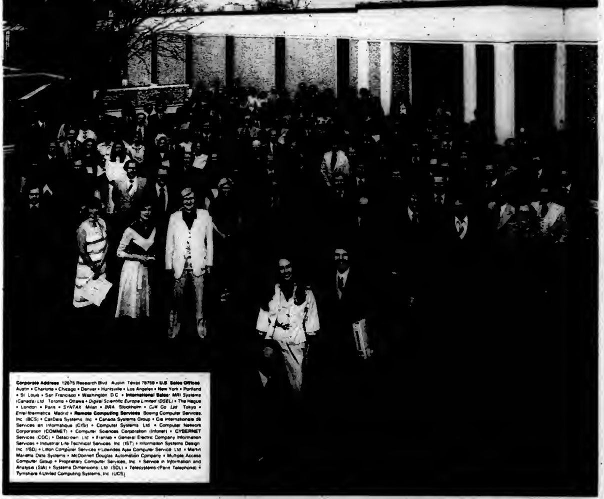

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Board Gives GA Users Up to 64K of Memory

SANTA ANA, Calif. – Trendata/-Standard Memories has announced a semiconductor memory module for General Automation, Inc. 16/110 and 16/220 minicomputers.

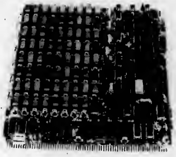
The Pincomm AS offers 350 nsec access and 450 nsec cycle times. It utilizes 16K by 1 MOS storage devices and is available in 16K-, 32K-, 48K- and 64K-word capacities, the firm said.

The amount of memory to be addressed and its starting address are both switch-selectable in 16K increments for ease of system configuration, according to a spokesman.

Parity is performed on a word basis, with all functions equivalent to GA memories, the firm said. Two LEDs indicate when either a data error or instruction error has occurred.

A 16K-byte Pincomm AS memory costs $1,364, a 32K-byte unit costs $1,864, a 48K-byte unit costs $2,391 and a 64K-byte memory costs $2,954.

Trendata/Standard Memories is located at 3400 W. Segerstom Ave., Santa Ana, Calif. 92704.



Pincomm AS

Irrigator Links Business System, 370/145

(Continued from Page 57)

mand and current availability of parts and finished goods.

To support these applications, the division, as Rixford puts it, "had to get into the data base business." The distribution data base is made up of the customer master, item master, open order file and several control files.

The inventory system uses its own data base plus the distribution data base. The inventory system looks in the distribution data base for part descriptions, customer names and all open order sales data.

Second-Year Projects

"Once the first two applications were up and running," Rixford said, "we were able to come up with some very lucrative results for very little added work. In fact, the HP3000 system has already paid for itself."

One important enhancement involved the expansion of the distribution system to produce pick lists. The shipping supervisor uses an on-line program to develop a complex set of rules for selecting and prioritizing orders form the open order file.

The system then applies available inventory to these orders and produces the appropriate pick lists. The pick lists, which are sent to the shipping warehouse, tell the order pickers the exact shelf location where they can find the product.

In addition to the expansion of the two systems, the Irrigation Division has developed some "high payoff" applications, Rixford said. In the operational aids area, for instance, the division developed programs for engineering change effectivity control, production hours forecast, inventory analysis, distributor sales analysis and open order analysis.

In the managerial aids area, the division developed applications for sales history analysis, order statistics, shipping statistics and warranty analysis.

To date, the HP 3000 can be accessed through 13 terminals. There are two terminals in the production control area, one in the manufacturing offices, one in the work-in-process warehouse, two in sales, one in the finished goods warehouse, one in international sales, two in program development and three in the machine room — an on-line data entry terminal, the RJE terminal and the operator's console.

Personnel in the Irrigation Division log onto the system by themselves and call up the programs they want to use quickly and simply, Rixford said. All program development is done on-line. The system's real-time multiprogramming executive operating system is designed to allow use of the system resources by a variety of users.

One of the features that Rixford feels has been helpful in the division's rapid development of on-line systems is DEL. This software includes a forms maintenance program for screen creation, updating and deletion, as well as procedures for data editing and terminal manipulation.

Rixford uses this software, along with a simple driver he developed, to model the operation of applications before spending time and money in actually programming them.

"The language allows us to accurately model the user portions of an application with a very low investment in time and effort," he noted. "As a result, we can iron out user interface problems before any programming begins and can speed up development."

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Adventists' Mini Simplifies General Ledger

(Continued from Page 55)

which comprise the southern conference.

Friday and the three staffers operate the DP shop which produces a weekly payroll for 500 persons including 200 pastors and associated pastors as well as 107 school teachers. The shop also handles DP for two Adventist bookstores.

"When I arrived in 1973," Friday observed, we had payroll and accounting on an IBM System/3 Model 6, which was updated to a Model 8. Both were strictly batch systems.

"We wanted to get away from time-consuming batch processing and allow the payroll department to input data directly on an interactive system for more rapid turnaround." At that time the IBM system was pushing its limit, Friday added.

Investigation Begins

He started investigating Wang's equipment at the 1975 Computer Caravan at the Los Angeles Convention Center. While looking at a data entry device for the System/3 that would check batch totals of receipts on-line, he stopped at the Wang exhibit.

Subsequently Wang announced the Wang VS. Friday attended a seminar and demonstration the week of the announcement. Then, following the lead of the Adventists' Union Office, the Southern Conference also signed up for Wang.

Friday is impressed with the machine's on-line interactive capability. Now the DP department can easily answer general ledger questions.

Two Adventist programmers confer about combining three large programs.

"Our assistant treasurer was perpetually asking me to perform inquiries to particular accounts on his general ledger under the old system," Friday recalled. The Wang system's capability "allows immediate display of the general ledger. I have even written a program he can use for on-line inquiry."

The debug utility is also important to Friday. "I can look at the source program while the machine is running, find out what's wrong and get the bugs out of the program," Friday explained. "This is very unusual for a computer this size, and it saves a great deal of time," he added.

Simple Conversion

The Southern Conference plans to use all the languages offered in the Wang mini. The shop was able to easily convert its 250 programs to the system, and Friday expects to shift to Cobol as time goes on. Basic will be used when the church's union office sets up a telecommunications and data entry trust accounting package for all the conferences.

Friday is also pleased with the CRT. "With the IBM system, in order to design a screen display, you had to get a piece of paper, write down your field descriptors and then enscribe your field," he pointed out.

Cost justification is also evident to Friday. "With the IBM System/3, we paid $2,400/mo. We didn't have CRTs; we didn't have our membership on-line; we didn't have the utilities; we didn't have three languages; we didn't have telecommunications capability; we didn't own the system — and we had only 1/30th the storage," he remarked.

"By depreciating our Wang VS over five years, the projected cost including tax and maintenance is $3,000/mo," he said.

Computer Optics announces a new 3270 feature.

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'Great Merchandising Tool'

Mobile Home Becomes Micro Showroom

By Ann Dooley
CW Staff

S. PORTLAND, Maine — Trying to get prospective buyers out of their offices and into a computer showroom is "like pulling teeth," according to Al Dussault and Don Turner, so instead the partners decided to bring the showroom directly to the buyer.

Turner and Dussault, owners of the Computer House, decided that the best way to exhibit their product line of micros and minicomputers was to transport the equipment via a mobile home to prospective buyers' front doors. The traveling computer salesmen cover a 25-mile radius in rural Maine and say that this way businessmen are "eager to come out," both because of the novelty of the idea and to seriously inspect the equipment.

"It's a great merchandising tool. Once the initial contact has been made, usually over the telephone, we pay a visit by driving the mobile home to the businessman's office and inviting managers in for on-the-spot demonstrations," Turner said.

"We've had people walk in with no connection to the group we were talking with and show interest in buying some equipment, and we've even had offers to buy the mobile home," he added.

The response has been tremendous, primarily because of the van's appearance — people just don't see something like that every day, he noted.

Don Turner (at keyboard) and his partner Al Dussault (far right), owners of the Computer House of South Portland, Maine, show off an Infotecs IMP microcomputer installed in their mobile office. Looking on are Calvin Holt (left), vice-president for Marketing, and Edward Tolson (second from left), president of Infotecs, Inc. of Manchester, N.H.

The Computer House, a franchised affiliate of Infotecs, Inc. of Manchester, N.H., demonstrates Infotecs, Digital Equipment Corp. and Olivetti Corp. equipment.

The motor home was designed to be plush, according to Turner, who explained that the sink, stove and dinette were removed and wall-to-floor-to-ceiling carpeting installed to give the van a living room effect. The van carries its own "clean power" so the equipment can be demonstrated anywhere.

Since most of the gear uses floppy disks, the environment doesn't have to be as closely controlled as in large computer rooms. "smoke or dust doesn't bother the machinery and that's exactly the point we want to make to these small businessmen who don't have the space to set up a separate computer area," Turner said.

This direct "on-wheels" approach has been successful for Turner and Dussault in the year since they have been driving their computer house around the Portland area. Infotecs named the house "outstanding dealer of the year" for selling more computer systems than any other dealership in the country.

The idea for the traveling showroom came from IBM, Turner said, noting that at one time that company used a similar approach. "We figured if IBM could do it, so could we."

In addition to hardware, the Computer House also features software for general ledger, order entry, payroll, job costing, income tax preparation, voter registration and several other business applications. All software is written in Hybol/Dybol or Basic.

The Computer House can demonstrate any of the equipment, depending on customer's needs. Several of the micros can fit in the house and are movable whenever necessary, he said. The various systems include the Infotecs Instant Management Power (IMP) microcomputer with a CRT, printer and MPU; DEC's 201 and 202 word stations, the data station 78 and PDP-8 (all sold on an OEM basis); and several pieces of Olivetti equipment.

The whole idea of the Computer House is to get the businessman away from his telephone. Once he's involved with the equipment demonstrations, it's often hard to tear him away, Turner noted. Some people try using it themselves and spend hours experimenting with it, and he emphasized, that's what makes for sales.

System Uses Basic, Assembly; Suits Control, Personal Uses

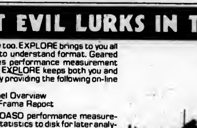
LOCKPORT, Ill. — Kinetic Systems Corp. has introduced a stand-alone microcomputer system, the Camac mini crate, that can be programmed in Basic or assembly language and can be used for business, personal or control applications.

The Camac is a version of the company's 8010 microcomputer system and, because of the system's modularity, it can be configured for "nearly any application," the firm said.

Communications between the microcomputer and the modular components of the 8010 system is via a microcomputer peripheral bus that supports up to 64K bytes of random-access memory (RAM) and erasable programmable read-only memory (Eprom), diskette drives and as many as seven crate controllers and their associated crates of process I/O modules.

The Camac mini crate version of the 8010 reportedly offers all the power of the standard configuration in a smaller package containing 12 stations.

The system costs $4,695 and up depending on the configuration, from 11 Maryknoll Drive, Lockport, Ill. 60441.



Mini Crate Version of Kinetics' 8010

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Personal System Boasts 13-In.Color CRT

NORCROSS, Ga. — Compucolor Corp. has unveiled the Compucolor II, a personal computer available in five models.

All models come equipped with a 13-in. color CRT, eight background and foreground colors; all editing features and a built-in single mini disk drive with 51 K bytes of storage with Disk Basic.

The models range from a 4K random-access memory (RAM) version with a 16-line by 64 char./-line format to one with 32K RAM and featuring a complete graphics package, a 32-line by 64 char./line format, an RS-232C interface and a 72-key keyboard.

The Model 3, with 32 lines and 8K of memory, graphics and RS-232C interface, retails for $1,495. The Model 4, featuring a 32-line format, 16K of memory, graphics and RS-232C interface retails for $1,795, and the Model 5, with 32-line format, 32K of memory and graphics, retails for $2,395.

The Model 1 with a 16-line format and 4K of memory and the Model 2 with a 16-line format and 8K of memory retail for $795 and $995 respectively and will not be available until February, Compucolor said.

Compucolor Corp. can be contacted through P.O. Box 569, Norcross, Ga. 30071.

Memory, I/O Peripherals Offered for Intel MCS-85

SANTA CLARA, Calif. — Intel Corp. has introduced three high-performance memory and I/O peripherals for the MCS-85 micro system. The peripherals and the recently introduced 8085A-2 CPU allow the performance of 8085A systems to be upgraded from 3MHz to 5MHz, the firm said.

The devices are the 8355-2, featuring 16K of read-only memory (ROM) with two programmable I/O ports, and the 8155-2, each containing 2K of static random-access memory (RAM) with three programmable I/O ports and a 14-bit programmable counter/-timer.

The devices plus the 8085A provide a three-chip micro system that operates more than twice as fast as other systems, the company claimed.

It contains a CPU, 256 bytes of read/write memory, 2K bytes of program storage, 38 programmable parallel I/O lines, serial I/O ports, system clock, system controller, multilevel maskable vectored interrupt control and a programmable interval timer and event counter, the firm said.

The 8155/56-2 device costs $30 in single quantities and the 8355-2 is $21.55 in quantities of 250 from Intel Corp., 3065 Bowers Ave., Santa Clara, Calif. 95051.

Cassette Tape Suits Micros

PALMDALE, Calif. — Racet Computes has introduced a special-formulation cassette tape optimized for microcomputer applications that will reduce problems such as lost programs, noise and extraneous bits of information in programs and the sensitivity of a system to critical volume settings, according to the company.

The Microcomputer Tape features a broad frequency range, "exceptional" density characteristics, consistency in recording and five-screw shells with lubricated liners, according to the firm.

C-20 cassettes cost $14.95 for 10 and $119.95 for quantities of 100 from Racet Computes, 702 Palmdale, Orange, Calif. 92665.

Computer Store Adds Three Outlets On East Coast

BURLINGTON, Mass. — The Computer Store, Inc. has opened three franchised outlets in Hartford, Conn., Rochester, N.Y., and Tampa Bay, Fla.

Begun three years ago, The Computer Store, Inc. now has six operating outlets. The stores act as suppliers to commercial users of small computers and carry Data General Corp.'s Micronova as well as Cromemco Corp. and Apple Computer, Inc. microcomputers.

Bit Pad Gets Link to TRS-80

FAIRFIELD, Conn. — Summagraphics is now offering an interface for the company's digitizer, the Bit Pad, to the Radio Shack TRS-80 microcomputer.

The interface permits the entry and transfer of X-Y coordinate values for graphics and data entry applications from the Bit Pad to the TRS-80.

The device includes a cassette for loading of the operating program to permit transfer of data. In addition, the interface allows use of all other TRS-80 accessories, the firm said.

The unit costs $175 from Summagraphics at 35 Brentwood Ave., Fairfield, Conn. 06430.

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Computer Business News

Expands Small Systems Products

HP Marks Mid-Range Turning Point

By Jeffry Beeler
CW Staff

CUPERTINO, Calif. — With last week's addition of two mid-range offerings to its small systems line, Hewlett-Packard Co. signaled a turning point in its development as a business computer supplier.

Since 1975, when it introduced its first small business system — 3000 series — HP has enlarged its share of the domestic computer market to about $600 million, with commercial DP offerings accounting for 35% to 40% of that total, according to Paul Ely, vice-president and general manager of the Computer Systems Group. But even as sales of the 3000 series jumped an average of 50% each year, HP market strategists recognized they could not sustain that growth rate indefinitely with a small systems line consisting of only one model.

Earlier this year the firm began broadening its business systems family, first with the introduction of the bottom-of-the-line Model 250 system and the top-of-the-line 3000 Series III and then last week with the announcement of two additional systems — the Model 300 and the 3000 Series 33. By increasing the variety of its small systems offerings, HP is aiming to ensure that the business computer sales growth it has enjoyed during the past three years will continue at roughly the same rate well into the 1980s, Bill Krause, marketing manager of the General Systems Division, explained.

End of First Phase

In Krause's view, HP's two latest product announcements mark the end of the company's first phase of development as a small systems supplier. During that phase, which began three years ago, the firm's efforts to gain a toehold in the commercial systems sector resulted in the formation of General Systems, which produces and markets small systems for nontechnical users.

The company also focused on expanding its business systems line as well as its family of data entry, storage and output peripherals. At the same time, HP bolstered its worldwide marketing and field support organization. In short, the first stage laid the groundwork for the firm's transition into the second phase of its development as a business systems vendor.

Slated to begin in early 1979, this next evolutionary stage will coincide with the introduction of a second-generation of HP small business products that will allow the firm during the next three to five years to exploit market opportunities that its current generation of commercial DP offerings uncovered but only partly explored, Krause said.

As HP's commercial systems effort evolves during the next three to five years, the company will concentrate primarily on broadening its applications software library as well as its repertoire of small systems hardware, Ely predicted. Moreover, the firm plans to further strengthen its global field support

(Continued on Page 64)

Lessees Now Seek Lessors With Remarketing Skills

By Robert E. Applegate
Special to CW

Users considering lease financing of DP equipment through third-party lessors have always considered the monthly lease rate the single most important element in selecting a lessor. However, in recent years, as the resale value of installed computers moves directly in relation to planned and actual new systems availability, lessees added several other factors to their list of primary considerations.

These included the extent to which residual value curves can be protected, the ease with which a lease permits upgrades to new equipment and the strategy for employing both investment tax credit passthrough and purchase-option credit buildup to obtain the maximum financial benefit with the minimum risk from a lease.

Today, there is still another capability a potential lessee should look for in a lessor: a strong remarketing capability.

Remarketing is a technique lessors use to ensure that their lease clients can obtain the maximum return on the value of currently installed equipment when they plan to replace it.

The more the lessor can get when he resells old equipment, the lower the net cost to the lessee when he upgrades to new hardware.

The remarketing of used equipment has grown to be an enormous part of the computer industry. At its recent annual meeting in Bermuda, for example, the Computer Dealers Association — a trade association of companies which buy and resell used equipment — increased its membership 25%, to 80 members. A look at the classified section of trade publications provides further evidence of this trend.

Now when a user wants to obtain a leveraged lease for a system, he has to evaluate the remarketing capabilities of the lessor besides the usual low rate, total financing capability and protection factors.

Need for Skill

The most obvious reason strong remarketing skill is important comes at that point, midway through a long-term lease, when the user wants to upgrade to the new Superdooper/Two. To do so, he obviously must get rid of his current Superdooper/One. Since the current monthly payment was based partly upon the projected value of his current equipment over its lease life — the residual value curve — the point at which the user elects to upgrade has a specific effect on what his new lease payments will be.

(Continued on Page 66)

Suit Sparks Announcement

National Semi Planning Mini Compatible With PDP-11/34

By Marcia Blumenthal
CW Staff

SANTA CLARA, Calif. — National Semiconductor Corp. has announced its intention to produce a minicomputer line — the Series 200 — completely compatible with Digital Equipment Corp.'s PDP-11/34.

To clear the way for marketing the product in early 1979, National Semi has filed an action against DEC asking for a ruling that various DEC patents are invalid and unenforceable and that National Semi has not infringed on those patents. The action was filed in the U.S. District Court for the Northern District of California.

Based on past actions by DEC, according to National Semi's legal counsel, John Webb, there is reasonable concern that DEC will file a patent infringement action against National Semi. Four specific patents are discussed in the action.

The lawsuit is a means of clearing the way for making the Series 200, a National Semi spokesman said. "However, the two are not necessarily linked; we will market the product anyway because who knows how long the case will drag out, unless DEC gets an

(Continued on Page 64)

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(Continued from Page 63)

organization.

Like most of its competitors in the small systems sector, HP regards distributed processing as the keystone of its business computer marketing strategy during the coming years. Unlike most other small systems suppliers, however, the Palo Alto, Calif.-based firm plans to limit its marketing effort to configurations in the $10,000 to $250,000 price range, Ely said. Many of the firm's rivals in the business computer market, by contrast, already offer or will soon announce small systems costing as much as $400,000 to $500,000, he noted.

HP's tactic of restricting General Systems activities to a relatively narrow sector of the commercial systems spectrum will allow the firm to sharpen the focus of its computer-related research and development effort, Ely added.

HP's business DP marketing strategy also differs from that of most of its competitors in its approach to systems design. Whereas many of its rivals market systems that are little more than modified versions of their general-purpose offerings, HP has designed its business systems "from the ground up," Krause explained.

"When you compare our business and general-purpose systems, you can immediately tell the difference," he said. "Not only do the business systems look completely different from our other lines, but they also have built-in features that make them easier for business users to operate than our scientific or engineering minis."

The differences between HP's general-purpose and business system designs reflect what the company sees as a fundamental change in the way major categories of small systems hardware are defined. "The dividing line between traditional classes of equipment are becoming more and more fuzzy as time goes by," Krause noted. "Today, systems are distinguished not by conventional notions of what separates one class of hardware from another, but by the applications they perform."

Accordingly, HP has restructured its business systems marketing philosophy to stress not the sale of general-purpose machines, but of systems designed to solve well-defined applications problems, Krause said.

National Semi Planning to Market Mini Compatible with PDP-11/34

(Continued from Page 63)

injunction against us," he added.

Pointing to various alternatives such as licensing agreements, the spokesman indicated the case may not necessarily end up in the courts.

Not Many Details

Pricing and distribution strategies and other product information on the Series 200 will not be announced until late this year. "The only reason we announced what we are doing at this time is because we filed a suit. We are giving analysts and the press and everyone else a synopsis of what's happening," the spokesman said.

However, the spokesman did say that the mini line will be marketed to large users in OEM quantities. The Series 200 will be the first plug-compatible computer National Semi will market to the user, the spokesman said, noting that the company currently supplies plug-compatible IBM equipment to Itel Corp.

While stressing again that the company will not define its strategies until later this year, the spokesman said there are prototypes of the computer and National Semi has started manufacturing it. No Series 200s are in the field yet because the company is still surveying the market.

"We feel expansion into plug-compatible machinery is a natural for integrated circuit makers," the spokesman said, adding that the mini is part of National Semi's ongoing plug-compatible strategy.

On the East Coast, a DEC spokesman said that company's lawyers had not had a chance to "thoughtfully review" the legal documents. Moreover, since details of the product were not available, DEC could make no further response, he said.

However, DEC is confident its patents are valid, the spokesman emphasized.

Communications Topic of Bulletin For Executives

BROOKLINE, Mass. — *Intel-Trade* has been launched as a newsletter reporting on international activities in the telecommunications industry.

Marketing information, procurements, financial trends and key participants in the telecommunications industry will be the subjects of the newsletter, which is aimed at assisting high-level executives in assessing market conditions.

Subscription Rate

The subscription rate for the newsletter, published every two weeks, is $300. An introductory discount of one-third off the regular price is available until Dec. 31.

Further information is available from Information Gatekeepers, Inc., Suite 212, 167 Corey Road, Brookline, Mass. 02146.

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To Reflect Specialization

Signetics Reorganizes Industry Sales Group

SUNNYVALE, Calif. — The increased complexity of the computer industry and the growing number of multinational companies were the major factors in the recent decision to reorganize the Industry Sales Group at Signetics Corp.

Headed by Robert Lanford, the reorganized group will stress industry specialization, with three distinct sales organizations: EDP, commercial and military. In addition, the group will expand its customer support and applications engineering activities.

As a result of the company's recently completed analysis of the semiconductor industry, Lanford said, "We have clearly determined there is a group of mature industry markets that need to be serviced by specialists who understand the present and future integrated circuit (IC) requirements of individual industries and the technical demand of specific applications. Organizing to meet these needs is a departure from the typical semiconductor sales organizations, which are structured according to types of products or process technologies."

Lanford, who is responsible for implementing the organizational change, maintained that the computer industry is now essentially several industries, each with specialized IC requirements.

Pointing to the minicomputer, magnetic memory, floppy disk and terminal segments, Lanford said the sales force not only has to sell products but now also has to design assistance for products two or three years in the future.

Multilocation Emphasis

A major focus of the EDP sales organization will be multilocation, multinational customers. "EDP customers now typically manufacture a variety of equipment in several locations," Lanford explained." They have some common circuit requirements throughout the product line and some special requirements.

"Inventory management is what has killed our industry over the past five years," he declared. Accordingly, the industry sales group and support staff have been strengthened, with additional staff coordinating orders "throughout various buying locations of customers."

As the customer's business physically expands, he doesn't realize what he needs in every location. "We can make sure the customer does not have excess inventories and we can now track shipments to him more carefully," Lanford noted.

The organizational plan is not unique, he said, pointing out that other companies have tried the industry specialization structure over the past five to 10 years. "It's a plan a lot of companies would have liked to have carried out, but never bothered to staff accordingly," Lanford said.

When fully staffed, Sigmetics' EDP sales organization will include 15, salespeople and will account for 40% of all personnel in the Industry Sales Group.

EDP sales is headed by Clay Marr. Marr has held the position of EDP sales manager for more than a year. The group is also being expanded with the addition of David Duncan as key account manager. Duncan recently joined Signetics from Elmar Sales, an electronics distributor.

Floating Point Shares Sell Out Quickly

NEW YORK — The initial Sept. 28 public offering of 750,000 common shares of Floating Point Systems, Inc. stock sold out quickly. By the end of the day's over-the-counter trading, the stock's price had jumped from $18 per share to about $26.50 per share.

Part of the proceeds of the stock offering will be used to pay off short-term debt and finance a new building.

The company sold 588,284 shares and certain stockholders sold the remaining 161,716 shares.

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NCR Board Approves Acquisition of Quantor

DAYTON, Ohio — The board of directors of NCR Corp. has approved the proposed acquisition of Quantor Corp. by NCR.

Under the terms of the proposed acquisition, NCR would pay holders of Quantor common stock $3 per share in cash. Holders of Quantor's Series A preferred stock would receive in cash the liquidation value plus accrued dividends on their stock which would be approximately $1,550,000.

The acquisition is subject to final approval by Quantor shareholders at a meeting scheduled for mid-November.

"The acquisition of Quantor is designed to provide the nucleus for NCR's future expansion in computer output microfilm systems and in the micrographics field in general," according to William S. Anderson, NCR chairman.

"Quantor would, under its current management, operate as a micrographics development, manufacturing and marketing entity reporting as a part of NCR's Systemedia Group," he noted.

NCR and Quantor announced agreement in principle to the proposed acquisition on Aug. 1.

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WANG

Users Now Seeking Lessors With Remarketing Ability

(Continued from Page 63)

Obviously, the asset depreciates the longer it is in service, but the nature of the new series of equipment may alter the residual value curve, making the current asset less valuable.

Current generations of installed equipment tend to hold their value very well during the first few years of service, but they take a sharp drop — perhaps 20% — when the next generation is announced. Several months before first deliveries of new-generation hardware, there is usually another steep decline in value and then a continuous, if not steady, drop over the remaining useful life.

This pattern was followed by the IBM 360 and now by the 370 systems as newer generations were first announced and then delivered 12 to 18 months later.

Six Services

Obtaining the maximum price for used equipment — and therefore the most favorable rate when the new equipment goes on lease — a lessor with strong remarketing capabilities can be helpful to the user in six specific ways:

- *By providing "current value" monitoring.* By working in the used equipment market every day, the lessor not only knows the current value of various systems on a daily basis, but also has a feel for where market values are heading. As a result, he can advise clients on the timing of resale transactions.

- *By providing "future value" projections.* Forecasting residual value curves over both the leased life and the useful life of computer assets has been a less than perfect art in the past, as many lessees have discovered when trying to upgrade midway into a long-term lease.

A strong remarketer, however, can constantly adjust value curves so a lessee has better data for making timing and upgrade decisions. This assures a "no surprises" approach to asset management.

- *By providing short-term solutions to equipment requirements.* Increasingly, users find themselves adding to installed equipment to sustain its performance for a longer period of time. Sometimes such additions —memory, disks, I/O devices — are needed immediately. Often, a good remarketing lessor can obtain needed equipment in the used equipment market very rapidly and at far less cost than from the hardware vendor. In this way, the lessee gets the benefit of additional options to consider.

- *By locating the best buyer.* This is not always possible because of timing and other constraints, but a lessor whose presence in the used equipment market is strong very often has relationships with end users as well as finders and brokers.

Invariably, direct selling from one user site to another, without middlemen, returns the highest resale value against a lease upgrade.

- *By acting as a single-source expediter.* Used equipment must be removed from a user site, often reconfigured by adding or deleting options and recertified as to its maintenance status by the hardware vendor. It then must be moved to the new user's location.

A lessor who is also a remarketer has the systems and capabilities in place to execute these procedures smoothly.

- *By strategic counseling.* Elements of a lease, such as optimizing the timing and use of purchase-option credits, preserving investment tax credit via a sublease, sales tax considerations and lease terms and conditions, can often mean a swing of several hundred thousand dollars on a major lease transaction. The lessor with remarketing capability can gain every cent of advantage possible for his client by advising and counseling him on the best ways to manage such factors.

These are just a few of the principal advantages that a user can realize when planning to install equipment on a lease basis.

The lessor who has a strong presence in the used equipment market, who buys, sells, warehouses and works within the market every day, is increasingly capable of putting together a better total lease package than the lessor who perceives remarketing as far too difficult and complex a task.

Applegate is director of remarketing for Finalco, Inc., a lease underwriter.

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Expansions

Data Terminals and Communications has begun construction of its new 25,000 sq-ft manufacturing facility and headquarters at 590 Division St., Campbell, Calif. The $1.5 million facility will double the size of the present facility.

Dynabyte, Inc. has moved its headquarters to 1005 Elwell Court, Palo Alto, Calif. 94303. The facility will house administrative, engineering, final production and testing functions.

Memorex Sets Up Centers To Centralize R&D Effort

SANTA CLARA, Calif. – Memorex Corp. has centralized its research and development effort by establishing two corporate technology centers here.

The Recording Technology Center and the Magnetic and Chemical Technology Center are responsible for long-range research over the spectrum of emerging memory technologies. In addition, the centers will evaluate the commercial feasibility of specific technologies.

Until the establishment of these corporate-level centers, R&D at Memorex had been carried out primarily at the divisional level. The R&D work done at the corporate level will benefit all Memorex divisions, a company spokesman said.

Memorex's Recording Technology Center, under the direction of Frank Sordello, is responsible for digital recording technology for rigid and flexible disk drives and tape drives for both the large and small computer systems markets.

Sordello noted that his center is also charged with monitoring all technologies that may have future applications in digital recording hardware. Of particular interest to this center are thin film heads and media.

The Magnetic and Chemical Technology Center, headed by Eric Daniel, will focus on developing technology for products such as computer tape, disk packs, cartridges, flexible disks and an expanding line of word processing supplies.

Analysis and development of advanced chemical formulations and surface coating are the center's special areas of interest.

To assure the success of this corporately sanctioned venture, Memorex has allotted separate space to the centers and has made a sizable investment in equipping them, a company spokesman noted.

In the past five years, Memorex has increased its in-house R&D investments more than 300%. In 1977, for example, the total engineering staff was expanded by more than 40%, the company pointed out.

Canadian Systems Total Almost 7,000 Last Year

TORONTO – The number of computers installed in Canada totaled 6,799 as of May 1, 1977, up 14.5% from the previous year's 5,397 units, according to the recently released *Canadian Computer Census* published by the Canadian Information Processing Society (Cips).

While IBM's share of the total installations declined from 28% to 25% over the most recent reporting period, it captured 65% of the rental market for systems in the $20,000-and-more-per-month.

Digital Equipment of Canada, Ltd. increased its share of the market by 2%, rising from 985 units, or 17% of the market in 1976, to 1,299 units or 19% of the market in 1977.

Honeywell, Ltd., however, lost market share, dipping from 532 units or 8.9% of the market in 1976 to 526 units or 7.7% of the market in 1977.

Univac Computer Systems and NCR Canada, Ltd. rounded out the slate of the first five finishers.

The Cips census did not include systems that rent for less than $1,000/mo because data collection in that category has become virtually impossible as a result of the recent proliferation of minicomputers.

DEC Building Boston Plant

MAYNARD, Mass. – Digital Equipment Corp. has broken ground for a manufacturing plant to be located on a six-acre site just south of downtown Boston. Completion of the 62,000-sq-ft facility is expected by next July 1.

The company said it will employ a start-up work force of about 40 employees who will be transferred to the Boston plant from other DEC plant locations.

The company said it decided to locate the plant in the downtown area to provide easier access to good jobs for people who need them. It is expected that most of the work force, which could reach 300 to 400 within two to five years, will be made up of Boston residents.

The number of new employees is expected to reach 150 by the end of DEC's first full year of operation in Boston.

The plant will manufacture computer subassemblies such as peripherals, terminals and options, the firm said.

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For Defense Forces

Racal Wins Australian Contract

LONDON — The largest defense communications contract ever placed by the Australian government has been awarded to the Racal Electronics Group. A portion of the $17.25 million contract will be filled by Racal-Milgo, Inc. of Miami, Fla.

The contract is for the supply of sophisticated transportable high-frequency radio communications stations and related items of equipment for use by the Australian defense forces.

The standard communications transmitters, receivers and modems which form a significant part of the contract will be manufactured and produced by Racal in Britain and in the U.S. by Racal-Milgo, Inc.

The Australian Minister for Defense, D.J. Killen, said the equipment would provide much-needed communications facilities for the Army, Air Force and a Joint Force on Deployment.

Contracts

Killen said Racal was selected after evaluation of proposals from four firms.

According to Ernest T. Harrison, Racal's chairman and managing director, "The contract is an important breakthrough for Racal in Australia and was achieved against fierce international competition. Close technical cooperation between Racal companies based in Britain and Australia has enabled us to produce the high-technology equipment required under the terms of this major defense communications contract.

"We believe another significant factor in this success was our decision to maintain a continuing presence in Australia over a long period of years when very few defense contracts were being awarded by the Australian government."

The order was placed with Racal Electronics Pty. Ltd., based in New South Wales, Australia.

Other Contracts

Honeywell, Inc.'s West German subsidiary has received a $26.7 million contract for high-performance infrared aircraft scanning systems for the West German Air Force.

The Pertec Division of Pertec Computer Corp. has been awarded a $2 million contract by Burroughs Corp. Under the three-year contract, Pertec T800 tape transports will be used in the Burroughs B800 small business system.

Computer Sciences Corp. has been selected to negotiate a contract to provide a nationwide computer information system for the Saudi Arabian Ministry of the Interior. The company's proposal has an expected contract value of more than $225 million over a five-year period, suject to final negotiation of contract terms.

E-Systems, Inc. has received a contract valued at about $350,000 from the Ottawa (Canada) Police Force for a digital radio system and 50 in-vehicle terminals.

Applied Devices Corp. and its subsidiary, Datatrol, Inc. has been awarded an initial $11 million contract for the design, installation and management of an on-line Lotto Game by the Canadian province of Ontario.

Data Electronics, Inc. has been awarded a contract to supply digital cartridge tape drives for use in a portable printed circuit board tester from Omnicomp, Inc. of Phoenix.

Norden Systems has negotiated a contract with the U.S. Navy to supply the first updated radar system for the EA-6B Prowler aircraft. The contract is valued at $4.8 million.

Infotron, Inc. has signed a contract with Western Union Data Systems Co. valued at a potential of $4 million over three years. Infotron will supply western Union Data Systems with CRT terminals for use in message and data communications systems.

Supershorts

Depositors Trust Co. has become the first bank in the Northeast to offer retail merchants the point-of-sale (POS) services of EFT Data Services, Inc. These services include check verification/guarantee and credit card authorization through the use of polled point-of-sale terminals resembling desktop calculators.

— — —

Datacrown Ltd. of Toronto has announced a five-year agreement with Hiram Walker & Sons Ltd., Walkerville, Ontario. The agreement provides for expanded services such as additional interactive program development applications and advanced computing facilities for Hiram Walker subsidiaries throughout North America.

— — —

Anacomp, Inc. has signed a letter of intent to acquire Compumatics, Inc. of Fort Wayne, Ind. Compumatics provides on-line services to wholesale distributors in Indiana, Ohio, Pennsylvania, Wisconsin, Colorado and Florida.

— — —

Infoton, Inc. and CII Honeywell Bull have signed a contract extension running to March 1980. Under the terms of the agreement, Infoton will supply CII Honeywell Bull with a version of its microprocessor-based I-400 CRT terminal for use on the latter's Model 62 and 61 computers. First deliveries are slated to begin this month, with volume shipments expected in early fall.

— — —

Memorex Corp. has opened its new 44,000 sq-ft manufacturing plant in Eau Claire, Wis., which will enable the company to increase its production of high-density, multilayer printed circuit boards and associated components.

— — —

First Computer Corp. has recently completed its second expansion in two years with a move to larger quarters at Westmont, Ill.

— — —

New England-based manufacturing operations of Harris Corp.'s Data Communications Division have moved to a three-building, $1.8 million complex in Nashua, N.H.

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Infoton Posts 176% Rise In Income Over 1977 Level

BURLINGTON, Mass. — Infoton, Inc. posted a 176% increase in income and a 24% increase in revenues over its 1977 fiscal year results.

Net income for fiscal 1978, ended June 30, was $569,702, or 16 cents per share, up from $206,309, or 6 cents per share, reported for the previous year.

Financial News

However, 1977 results included a loss of $327,046 for discontinued operations, which was reduced to $35,000 this year. Income from continuing operations, prior to deductions for losses and extraordinary credits, showed a 38% rise over the previous year's results.

Revenue for 1978 topped $9.3 million, up from $7.5 million for fiscal 1977.

Fourth-quarter revenue passed $2.5 million, up 7% from fourth-quarter 1977 results of $2.3 million.

Income for the fourth period was $151,481 or 4 cents per share, down from fourth-quarter income of $222,666 or 6 cents per share, in the corresponding period a year ago.

However, no extraordinary credit was taken in 1978's fourth quarter, whereas a credit of $94,000 was taken in the 1977 fourth quarter.

Commenting on the threefold increase in the price of the company's stock since April, President William G. Moore said, "I think we are benefiting from a general renewal of investor interest in potentially undervalued computer stocks. Infoton has been getting better visibility lately. A major contract award from Western Union during the summer seemed to spur investor inquiries."

The company has just introduced a smart terminal, the I-100, which will be demonstrated for the first time at Info '78 to be held in Chicago Oct. 16-19. First deliveries are slated for November, the company said.

Israel Offering Cash Grants To Some Firms

JERUSALEM, Israel — Companies with "approved enterprise" status are now eligible for additional administered lump-sum cash grants as a result of an amendment to the Law for the Encouragement of Capital Investments enacted recently by the Knesset. These grants, in most cases, equal about 5% of a company's fixed assets.

Another provision of the amendment allows foreign investors in some instances to use tax-exempt Israel pound profits for capital revaluation to offset devaluation losses.

The new industrial venture accorded approved enterprise status by the government can also receive up to 35% of its fixed investment in cash grants and another 40% of its fixed assets in low-cost, long-term loans. Other sources of financing are available, according to *Innovation*, an Israeli industrial publication, to provide operating capital for export purposes or to cover part of research and development costs.

The benefits of this law are credited with having attracted many U.S. and European firms to establish businesses in Israel. Other inducements, according to Innovation, are the availability of skilled labor, scientific and managerial staff and access to the European Economic Community.

Many high technology firms' including National Semiconductor Corp., have recently embarked on new ventures in Israel, the publication said.

Timeplex Sales Increase by 44%

HACKENSACK, N.J. — Timeplex, Inc. reported fiscal 1978 revenues totaling $11.5 million, 44% more than fiscal 1977 revenues of $8 million. Net income for the year ended June 30 was $545,000, or 33 cents per share, compared with income of $309,000, or 20 cents per share, for the previous year.

Fourth-quarter earnings were $134,000, or 8 cents per share, compared with earnings of $75,000, or 5 cents per share, reported in the corresponding period a year ago.

Board Chairman Edward Botwinick said earnings for the first half of 1979 are expected to exceed those for the record first half of fiscal 1978, although revenues for the period are unlikely to match year-ago revenues, which reflected a very large, nonrecurring order.

At year's end, Timeplex said it had repaid all of its bank debt, which totalled $1.1 million at the start of fiscal 1978.

Nickels & Dimes

Electronic Arrays, Inc. has agreed to be acquired by a U.S. subsidiary of Nippon Electric Co., Ltd. Under the merger agreement, shareholders of Electronic Arrays will receive $5 per share and will vote on the merger late this month.

$ $ $

Microdata Corp. has signed a new credit agreement for $15 million with the First National Bank of Chicago as the agent bank and with the United California Bank also participating.

$ $ $

National CSS, Inc. will use the proceeds from the sale of its 6-3/8% convertible subordinated debentures to pay the cash portion of the purchase price of Zytron Corp., with the balance to be added to working capital.

$ $ $

Computervision Corp. has announced to the Securities and Exchange Commission that it intends to file a registration statement offering approximately 400,000 shares of its common stock. The offering will be finalized in November or December.

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Ontel Corp. has arranged a $4 million, three-year revolving credit agreement with the First National Bank of Boston.

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Executive Corner

• Howard A. Thrailkill has been promoted to vice-president and general manager of Harris Corp.'s Composition Systems Division, Melbourne, Fla.

• Arthur J. Stanziano has been named vice-president of the International Division for Hazeltine Corp., succeeding James W. Evans, who has been appointed vice-president of marketing. Dennis M. Hoffman has joined the company as Southern regional sales manager of its computer terminal equipment product line.

• Y.E. "Ed" Juge has joined Radio Shack in the newly created position of computer products manager.

• Edward W. Dolinar has been promoted to the position of divisional vice-president for the northeast region for Data 100 Corp. The firm has also named David H. LaVine to the new post of division vice-president for the company's Iomec division.

• William Cassell has been appointed manager of national systems support at Sycor, Inc.

• Jagdish C. Chopra has become director of marketing research at TRW's LSI Products Division.

• Jack A. Bertch has been named vice-president of sales for Microdata Corp.

• H. William Swanson has been promoted to vice-president of software operations at Datapoint Corp.

• James J. Forese has been appointed assistant treasurer of IBM. J. Richard Young has succeeded him as president of the Office Products Division.

• H. Richard Cossaboon has been appointed director of marketing at Inforex Corp.

• Rand V. Araskog has been elected to the position of senior executive vice-president and chief operating officer at International Telephone and Telegraph Corp. (ITT) Araskog was also named to the executive committee of the ITT board of directors.

• David E. Schnebele has been appointed national accounts manager for Boeing Computer Services Co.

• Sal Castorina has been promoted to vice-president, manager of Michigan operations, for Financial Industry Systems.

• Ralph Hoibakk and Ole C. Schoel have been named members of the board of directors of Tandberg Data, Inc.

• Frank P. Casdia has been appointed national sales manager for Rotron, Inc.

• H.E.J. "Jime" Finke has been appointed vice-president and general manager of Data General Europe. He succeeds Barry J. Fidelman, who has become vice-president of marketing, Americas/Far East. Steve Gaal has been appointed director of systems engineering at Data General Corp., and John E.M. Gardner has been appointed controller for European operations.

• David G. Hensel has been appointed manager of communications product marketing at Decision Data Corp.

• Harry P. Rekas has been named assistant treasurer for Computer Sciences Corp.

• Dennis O'Donnell has been appointed director of national sales for Applied Digital Data Systems, Inc. Harold O. Jones has been named director of engineering services at the firm, while Alan G. Stromberg has assumed the newly created position of manager of intelligent terminals. In addition, Irwin Podbielak has been appointed director of quality assurance by the company.

• J. Ralph Leatherman has been elected chairman of the National Computer Conference Board.

• Norman C. Walker has been appointed president by the board of directors of Pfystar. His first official act was to institute a change in the corporate name to Pentron, Inc.

• Bill Crisp has been named administrative manager and W. Michael Langhart director of product development at Chase Computer Corp.

• John G. Kemeny, president of Dartmouth college, has been elected to the board of directors of Honeywell, Inc.

• Jon E. Reynolds has been appointed senior operations officer of Solar Services, Inc.

• Ray E. Miller has been named group director of General systems and memory systems at National Semiconductor Corp.

• Tom Edwards has been named marketing manager for Epic Data Sales Ltd. as well as the company's U.S. subsidiary, Epic Data Corp.

• Don Moore has been appointed manager of marketing services at the Pulsecom Division of Harvey Hubbell, Inc.

• Dick Milligan has been promoted to vice-president of customer service at System Industries.

• John T. Corser has been named manager of marketing communications for Qume Corp.

• M. Dee Bantillo has been made customer service supervisor at the Electron Division of NEC America, Inc.

• Brian E. Elliott has been appointed to the new position of product marketing manager for discrete semiconductor products at the Electron Devices Division of NEC America. Michael C. MacKanin has assumed the position of customer services department manager.

• Ted N. Brandon has been appointed vice-president of administrative services at Fisher-Stevens, Inc.

• William F. Jordan Jr. has joined Boschert, Inc. as vice-president of engineering.

• Peter S. Anderson has been elected vice-president of marketing development at Mohawk Data Sciences Corp.

• Samuel Ochlis has been appointed president of CSP, Inc.

• David C. Penning has joined the staff of Gnostic Concepts, Inc. as vice-president and director of the Computer Division.

• Jeremy L. Ipsen has been named vice-president of the computer group at Fabri-Tek, Inc. Richard A. Eichstaedt has been appointed vice-president of the firm's component group.

• Ian Caldow has been named vice-president of operations for Cipher Data Products, Inc.

New Companies

Active Learning Systems has been formed to develop computer-based education systems. The company is located at Suite 106, 601 Broadway, Denver Colo. 80203.

Mauro Associates, Inc. has been formed to provide human factors engineering and industrial design services to DP manufacturers and end users. The firm is located at 135 W. 41st St., New York, N.Y. 10036.

Records Technology Corp. has been formed to provide management planning, microfilm services, filing equipment, inactive archival storage and other services to solve record management problems. The company is affiliated with Iron Mountain Security Storage Corp. and is located at Suite 1143, 141 Milk St., Boston, Mass., 02109.

EICO Data Products has been formed to specialize in the marketing and distribution of terminals. It is a division of EICO Electronic Instrument Co., Inc. The company is located at 108 New South Road, Hicksville, N.Y. 11801.

Develcon Electronics., Ltd., a manufacturer of limited distance data sets, has expanded its marketing effort into the U.S. with the formation of Develcon Electronics Inc. The company is located at 423 N. Main. St., Doylestown, Pa. 18901..

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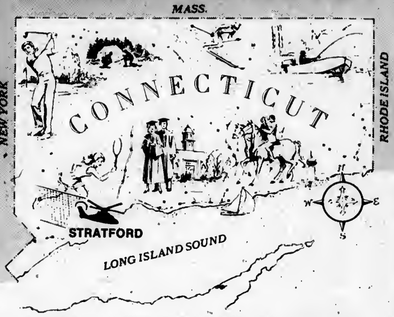

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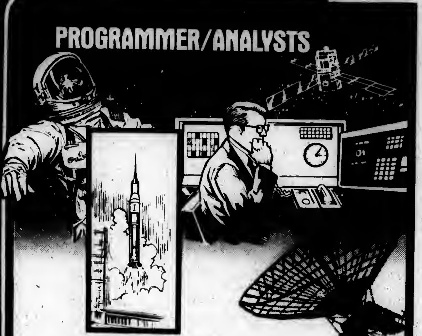

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Methods include: Top-down design, HIPO, structured walk-through simulation.

There are still some ground floor opportunities at the forefront of design and development for PROGRAMMER ANALYSTS who have above-average credentials and would like to embark their careers in our long-term retail systems research and development program.

If your background includes solid COBOL programming experience on large scale IBM equipment with exposure to IMS concepts, and you're ready to advance your career in a highly professional environment, working with concepts that are ahead of existing technology, then send your resume, including recent salary history to:

Mr. Frank McKain
Systems Research & Development,
Room CW-109

Federated Department Stores, Inc.

222 W. 7th Street
Cincinnati, Ohio 45202
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SENIOR SYSTEMS SOFTWARE TECHNICIAN

Our Systems Operations Division is responsible for the complete coordination of large integrated Systems Process Control Orders requiring unique digital applications involving software packages designed and developed by a team of professionals.

We are seeking an individual to become responsible for checkout support pertaining to software requirements of major sales order projects. This involves planning and coordinating software tasks such as software generation, data base generation, system testing, loading and start-up as well as software editing and revision. Responsibilities will include training, directing and assisting junior technicians assigned to projects.

We require successful experience in a leadership capacity within a computer operations environment as well as a basic knowledge of Fortran and/or assembly language. AS Computer Science or equivalent experience.

You'll find our compensation and benefits programs among the best in industry and you will share in our continued success through our Profit Sharing (7.7% in 1977) and Employee Investment Plans.

Forward resume, including salary requirements, to Linda M. Taneja, Dept. 109-C, The Foxboro Company, 38 Neponset Avenue, Foxboro, MA 02035. Or call her at (617) 543-8750, ext. 2915. Foxboro is an equal opportunity employer, M/F.

FOXBORO

An opportunity to join one of NCR's most far-reaching software projects and enjoy San Diego living.

If the challenge of developing data communications software for some of the largest, most ambitious on-line telecommunications networks ever designed appeals to you, get in touch with us fast.

You'll be joining one of NCR's most advanced and fastest-paced organizations, and entering rapidly expanding projects of the very highest visibility. You'll be working with the kind of high achievement professionals who have staked out a dominant position for NCR in the business and financial EDP markets. Show leadership ability and you'll find opportunities for advancement.

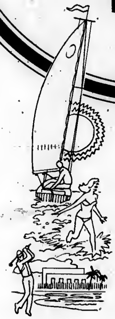
Due to our large number of openings there is excellent likelihood of finding exactly the position that fits your background and interests. We have immediate openings at middle and high levels requiring 2 or more years of software experience in the following areas:

COMMUNICATION DISCIPLINES

- Store-and-forward message switching
- Packet switching
- SDLC
- Bisync protocols
- Async protocols
- X.25
- Software development

NETWORK DEVELOPMENT

- Host-to-host, node-to-node, and end-to-end protocols
- Minicomputer operating systems
- Assembly language



If our professional environment is stimulating, so is our living environment. We're in Torrey Pines—a mile from the ocean and half an hour away from La Jolla or downtown San Diego. To arrange a full briefing send resume and salary history to: Ceser Nemba, Employment Specialist, NCR Systems Engineering/Torrey Pines, Dept. G50, 4045 Sorrento Valley Blvd., San Diego, Calif. 92121.

NCR

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Is searching for computer programmers who have business applications experience with: **ANS COBOL, OS JCL, On-line Programming, and Structured Techniques.** Any experience with ROSCOE, CICS/VS or RAMIS is a plus. We are a medium size shop running on an IBM 370/148. We offer an excellent benefit program in the environment of a large university. Please submit a resume with salary and work history to:

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Personnel Services — FREH
Purdue University
West Lafayette, Indiana 47907
(317) 749-6256

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Assume the responsibilities of auditing Syntex Computer Facilities worldwide! Your basic auditing will involve systems for the IBM 370/158 located in Palo Alto, CA., but your scope will extend to minicomputer applications at other Syntex locations. You will audit both existing and new applications systems as well as assuming responsibility for continued development of corporate EDP audit programs.

This key position requires a BS/Data Processing or Accounting (MBA preferred) and 3-5 years experience in EDP audit, application system development and systems analyst programming. Knowledge of COBOL and/or PL/1, strong analytical skills, ability to interact effectively with operating management and good writing skills essential.

SYNTEX is a unique, Multinational Corporation offering career advancement opportunities and most attractive compensation & benefits package. Relocation assistance. Please send resume, including salary history, in confidence, to A. Hell (Please refer to Ad #7586). SYNTEX, 3401 Hillview Avenue, Palo Alto, CA 94304. We are an equal opportunity employer.

SYNTEX

Communications Programmer/ Analysts

...for all-new digital network group

There are exceptional career-growth opportunities for software professionals to work on the design and implementation of a state-of-the-art minicomputer-based packet and message switch. The candidates we seek should have at least 2 years experience in programming at the Assembly language level. They should be familiar with the usage of vendor operating systems and have hands-on experience with minicomputer program debugging. Experience in any of the following would be a plus:

- Design of file structures, data base building and maintenance.
- Programming and debugging of software handlers and drivers for peripheral devices (disk, tape, etc. with DMA interface).
- Communications, especially with a packet network or message switch.
- Standard techniques of queueing within real time minicomputer operating systems.
- Coding of support utilities or debugging aids.
- MACRO assembler code generation/optimization in a minicomputer environment.

An academic background with a degree in Computer Science /Engineering helpful.

We are looking for an exceptional talent. You can expect an exceptionally challenging work environment and continually interesting assignments. You will work with a highly qualified professional team active in the development and application of advanced software technology for computer networks.

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Programmers

COBOL/FORTRAN

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All positions require the ability to interface on a variety of business and engineering applications including program design, program support and documentation. Must have two or more years' programming experience. Prior Univac 1100 series experience desirable.

For immediate consideration, please send resume in confidence to: Lyle Padgett, Bechtel
Employment Dept. 2-75-8
15740 Shady Grove Road
Gaithersburg, MD 20760

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BECHTEL

PROGRAMMER ANALYSTS

The Southwest Florida Water Management District, located in the central Florida community of Brooksville, is currently seeking individuals for their scientific programming area. Duties will include the creation and maintenance of an on-line MIS system in a technical environment. Knowledge of FORTRAN and COBOL a must. Experience with UNIVAC 90/30, DS-3 and IMS-90 a definite plus. Entry level as well as senior grade positions available. Please submit resumes along with salary requirements to the Southwest Florida Water Management District, 5060 U.S. Highway 41 South, Brooksville, FL 33512. EOE M/F.

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Are you tired of high taxes and expressway jams? Then you should consider the numerous critical positions that we have in N.H. for Applications Programmers, Programmer Analysts, Systems Analysts, and EDP Managers, all with either insurance or manufacturing applications experience. All positions with dynamic growth oriented firms. Salaries from low teens to thirties. Contact David J. Osgood, CEC, Vice President.

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Complete management responsibility for the Administrative Systems Office. Plan and develop all systems, including financial, student and personnel information. Requires a BS/BA and 5 to 7 years systems experience and computer knowledge. Salary Mid-20's. Send resume, including salary history, by Octover 20, 1978, to: T.J. Verbonitz, Director of Administrative Services, Bldg. 36.

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LARGE, MODERN, TECHNICALLY SOPHISTICATED CLIENTS located in the SUNSHINE STATE have requirements for PROGRAMMER ANALYSTS and SYSTEM ANALYSTS in the area of DATA BASE/DATA COMMUNICATIONS. EXPERIENCE with IBM 370, CICS, IMS, SDLC, SNA, NETWORKING, COBOL, ASSEMBLY LANGUAGE and a COLLEGE DEGREE is desirable. Please submit RESUME including SALARY HISTORY or CALL

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PERSONNEL
1211 N. Westshore Blvd.
Tampa, FL 33607
(813) 872-1853

COMPUTER SYSTEMS ANALYST

Large Manufacturing Company located in the midwest is seeking a person experienced in IBM and IMS-DB/DC systems. Excellent benefits. Send detailed resume including approximate salary requirement to C.W. Ramsey, Manager - Industrial Relations,

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PROGRAMMERS

Bored with Insurance Banking Applications?

Due to promotional advancement and expansion, St. Joseph Hospital, a leader in Health Care software development, is currently seeking career oriented high caliber Data Processing Personnel to work on development of "ON-LINE" applications. Current environment is DOS/VS on a 370/138; (VM will be implemented in early 1979 on a 3031). SPM is utilized for program maintenance and development.

SENIOR PROGRAMMER

Two years' minimum experience COBOL in a 360/370 environment. Experience with CICS or Data Base a plus. Will train qualified individuals in CICS.

SYSTEMS PROGRAMMER

Experienced with installation and maintenance of CICS/VS. Knowledge of BAL or Data Base a plus.

Positions compensated with excellent salary and comprehensive benefit package complemented by a pleasant working environment.

Please submit resume and salary requirements to:

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200 High Service Avenue
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Timeplex, the world leader in data communication TDM products, is expanding its Marketing and Engineering Development divisions. Opportunities are now available in the following areas:

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This is a high visibility Marketing position requiring interfacing with customers, the sales force and engineering. Responsibilities include setting of functional specifications, market research, sales forecast, proposal overview and product monitoring. Degree in Computer Science or E.E. and minimum 2 years experience desired.

SYSTEM PROGRAMMERS & DESIGN ENGINEERS

Knowledge of microprocessor (M6800, Z80, TI9900) software and/or hardware is required for these challenging positions. You will have key responsibility in the structuring of products at the forefront of technology that will be used in national and international networks. Degree in Computer Science or E.E. and minimum 2 years experience desired.

In addition to competitive salaries and excellent benefits, TIMEPLEX offers a stimulating working environment and substantial opportunities for advancement. Send resume, including salary history to the attention of:

S.P. HARITON

TIMEPLEX, INC.

100 Commerce Way, Hackensack, N.J. 07601

Timeplex
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DATA PROCESSING PROFESSIONALS

Career opportunities now available with a progressive Data Processing Organization in one of the fastest growing financial institutions in the Southeast. Current environment includes Twin IBM 370/158's OS/VS1, batch and on-line applications. We have immediate openings for the following:

PROGRAMMER/ANALYST

Requires 2 to 5 years experience, ANSI COBOL, OS/JCL and OS utilities. BAL knowledge helpful.

ON-LINE PROGRAMMERS

Minimum 2 years experience on CICS/VS, VTAM, NCP. Understanding of SNA helpful.

PLANNING ANALYST

Requires 2 to 5 years experience in tactical and strategical planning and feasibility studies. Knowledge of programming beneficial.

All positions relate to banking application. Degree in computer science, math or statistics preferred. Salary commensurate with background & experience. Excellent benefit package. Send resume and salary requirements to Ms. Deborah Kellermann, P.O. Box 012111, Miami, Fla. 33136.

Southeast Banking
Corporation

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DATA GENERAL—Nova ALP Fortran macro new application developmt $26-28K
CICS BAL DOS or **OS** imed intvws NYC. $27-29K
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VOICE Date analysis $17-21K
IMS Cnslnt to $65K
SOFTWARE Sysgens exp nec $27K
OS COBOL programmer-learn **DATABASE** degree $23K
DEC 10 COBOL Fortran PL1 T/S $25-27K
OS 1100 exec internals $23-29K
PUBLIC Finance computer analyst. MBA desired. Fortran timesharing. $25-31K
PL1 Fortren corporate finance anal. $27-31K
Property & Casualty DP Mgr NJ loc. $31-33K
PROG ANAL NJ loc COBOL DOS VS $23K
FORTRAN Timesharing-deg cnsltng. $19-26K
PRIME T/S spec COBOL $22K+
CMS OS PL 1 Fortran Remis Focus, deg. $19-27K

WALL STREET

Opportunity to join newly organized data processing dept. Ground floor opportunity. Positions include project management, systems analysis, Sr. Programmer analyst & programmer levels migrating upgrading from DOS to OS environment. No prior Wall St exp is necessary, although helpful. No prior OS necessary. Applications areas include all areas of financial and operational areas. Firm inventory trading etc. Salaries $21,000 to $33,000 plus bonus.

METHODS & Proced banking or bkge exp. $25K
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PROGRAMMER ANALYST:
Analysis & Application Programming on Hewlett Packard Mini Computers HP21MX and HP-3000 using Fortran and Cobol.

Excellent Salary and Company Paid Benefits.

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CSC

Ask Lynn Hopewell about Computer Systems Architecture at CSC.

You're likely to hear answers like these:

❝This part of CSC is a systems engineering organization. We do everything from the time an idea is a gleam in a client's eye, to the time it is something he can turn on and use. We used to be known strictly as a services organization, but we're changing rapidly into a group that provides services AND turnkey products — primarily in the computer and communications field.

❝Of course we don't manufacture computers or communications hardware, so when I say a complete product, I mean engineering and software combined with off-the-shelf computers, turned into a usable product . . . with the understanding that we buy the computers and anything else necessary to turn over to the client a complete operating entity.

❝My operation is targeted towards computer networks . . . those systems having a tight coupling between communications and computing. This is a very large and growing segment of the computer industry.

❝We're fortunate to have some very well recognized expertise in networking in the resource sharing and packet switching world. As a result, we can offer a broad spectrum of work on contracts like the WWMCCS Intercomputer Network, AUTODIN II and others now in house, plus some additional, equally challenging development opportunities in progress.

❝We can offer very meaningful posts to PhD's in Computer Science and Electrical Engineering for advanced network development situations solving rigorous theoretical and practical architecture issues. We also need junior software people and electrical engineers with good academic backgrounds who can grow into full fledged senior members of the staff. Our junior people are working themselves up the ladder so rapidly, we are constantly looking for more.

❝Mixed degrees are a special asset here . . . mixed BS, MS, and PhD's in EE and Computer Sciences. Another important need—people who know minicomputers — who are essentially hardware/software systems architects in mini's, but within the communications environment. They should be able to provide optimum hardware/software architectural solutions to complicated requirements. We also need message switching architects, computer benchmark experts, digital circuit designers, computer network performance modelers, and distributed data base/software designers.❞

If you'd like to chat further with CSC Technical Director Lynn Hopewell, he will welcome your call on (800) 336-0429, or telephone him collect at (703) 533-8877.

Otherwise, mail your resume in confidence to Mark Havard, in care of Dept. 416.

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COMPUTER SCIENCES CORPORATION SYSTEMS DIVISION
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applications programmer analyst

New York City

Interbank is the leader in the expanding EFT and bank card industry. Our two international banking networks (real-time and batch) use distributed processors, mini's, micro's and central duplexed IBM computer sites. We offer an opportunity to work in a challenging advanced application environment with a future in a small group with congenial talented co-workers.

Excellent salary, benefits and opportunity for advancement in our expanding data processing division. Work involves both solo projects and project leader control of software contractors. 20% domestic travel.

Requires minimum of two years analyst programmer experience, with one year of assembler or PL-1 (COBOL acceptable) and one year of systems design. Desirable to have third year of experience or computer science degree or MBA. Banking or bank card experience helpful.

Send resume with salary requirements
and history to Personnel Manager

master charge
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PROGRAMMER

Large scale, highly complex and challenging county government installation in "sparkling" Clearwater, Florida. Central facility providing service for all departments. COBOL mandatory and teleprocessing experience desirable.

IBM 370/155 and 370/145 installation utilizing DOS/VS and CICS. Program development in an online environment. Immediate opening $13,166.40 to start.

Send resume c/o Unified Personnel System, 315 Haven Street, Clearwater, Florida, 33516, Pinellas County Government, E.O.E., or call Mr. Ronald C. Bennett, Personnel Department, (813) 448-2367.

PROGRAMMER ANALYSTS

Excellent salary, liberal fringe benefits, in a country setting in central N.J., 370/148, DOS/VS/CICS. Minimum of 3 years COBOL experience is required.

Send resume and salary requirements to:

Carter-Wallace, Inc.
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Texas Federal Savings

SENIOR SYSTEMS ANALYST/PROGRAMMER

- 5 years experience required in IBM 360;370 (ALC).
- The candidate will have the ability to advise and consult on the implementation of systems/programming applications, devises data verification methods, code, debug and document programs.
- Expertise in all phases of systems analysis/programming work is a must.
- Savings and Loan or related financial experience preferred.

Please send resume to address below or contact the Human Resource Department for further information.

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AND LOAN ASSOCIATION

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To develop new applications for our $2.5 billion bank holding company.

As a member of our project teams you will be combining your talents with those of other D.P. Professionals in developing new on-line systems for our varied users including the Bank's International and Money Management Departments and our correspondents, using PDP 11/70 equipment and BASIC programming language.

In our retail banking system we are developing EFTS for our 47 branches using IBM software, 370/145 DOS/VS, as well as telecommunications equipment.

These developments offer challenging opportunities for programmers, systems programmers and systems analysts to work in a career oriented, team environment where individual achievements are recognized and rewarded.

If you feel your skills and philosophy integrates with ours, we encourage you to send your resume in confidence to:

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Tasks to be performed include:

- Integrating state-of-the-art statistical and scientific software into our corporate data processing network.
- Aid in consulting and training of our Hughes professional staff.
- Develop forecast models predicting future loading on our computer network.

This is a senior position requiring analysis, programming, leadership and a thorough knowledge of timesharing systems and FORTRAN.

Good communication skills and MS, PhD, or equivalent, in Computer Science or appropriate scientific field are MANDATORY.

SCIENTIFIC COMPUTING CONSULTANT

Tasks to be performed include:

- Providing programming and debugging assistance to scientific computer users, conducting seminars and short courses in FORTRAN, TSO, JCL, and other programming subjects.
- Writing user documentation, participating in software product evaluation, and software quality assurance.

A Bachelor's degree in mathematics or related science is mandatory. The qualified applicant should have experience in FORTRAN PL/I, TSO, and OS or VS JCL.

If you can meet our needs and are interested in discussing your role at Hughes and how we can meet your needs, please send your resume to: Hughes - C&DP Employment - 63LA CLN, Ground Systems Group, 1901 West Malvern, Fullerton, CA 92634.

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To develop an integrated data base for the University — 12 new analyst positions have been created.

6-Analyst I - Interested in data processing - a beginning position (college degree or equivalent experience).
4-Analyst II - requires a minimum of 2-1/2 years of (COBOL) experience and college degree or equivalent additional experience
2-Analyst III - two years of Analyst II type experience.

Send resume to:
Dr. John M. Tyler
System Network Computer Center
Louisiana State University
Baton Route, Louisiana 70809

AA/EOE

PROGRAMMER/ANALYST

To develop administrative systems, and provide technical assistance to students/faculty in statistical software uses and inter-active instruction and research applications.

The ideal applicant will have three or more years of programming experience, and will be competent in COBOL and FORTRAN or BASIC, and have data base design exposure in an on-line environment. Background in higher education preferred.

Salary is about $17,000, depending on experience and abilities. Four weeks vacation yearly. Liberal benefits.

Send letter, application and resume to: Mr. C.R. Weber, Personal Director, State University College, Oneonta, N.Y., 13820. Closing date for application is November 1, 1978. SUNY is an Equal Opportunity Affirmative Action Employer.

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Our prestige mfg client seeks an individual to direct the complete data processing and administrative resources of their organization. Position is located at desirable suburban corp hdqtrs site convenient to East Coast metropolitan and resort areas. Client seeks proven capability to motivate and supervise 80-120 personnel, knowledge of the latest data processing technology, as well as large-scale systems development capability. Our client seeks outstanding communications ability to deal effectively with top level corporate management. To discuss this outstanding opportunity contact, in confidence, Steve Burns, 215/561-6300

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Federal Express has opened a Data Center in Colorado Springs this August. A system is being developed which will operate under the Airline Control Program (ACP) and will service upwards to one thousand on-line terminals.

Federal Express is looking to add several professionals with two to four years experience with Assembler Language. Openings exist in the Applications Development Area, where PARS/ACP experience will be helpful, as well as in the Systems Programming and Support Areas where two years Systems Programming under MVS/VM is a prerequisite for consideration.

Federal Express, America's Airline for Packages, offers excellent compensation, a benefit package which includes interline travel and flight privileges on cargo planes, and advancement opportunity in a growth-oriented, creative environment. To apply send confidential resume, including salary history to:

Federal Express Corporation
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Clark Towers Location
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Programmers

Looking for upward mobility as well as challenging work?

Talk to Merrill Lynch

Your future with us is limited only to your abilities and ambitions. That's why if you're a talented programmer, eager to expand your technical know-how and career potential, we'd like to hear from you.

All positions are based at our New York City headquarters - in one of the largest, most advanced computer installations on the East coast. Salaries are excellent. Benefits are outstanding. And you'll have plenty of opportunity to move up fast in your area of interest.

Openings are for:

PROGRAMMERS

You'll join a select communications team in our Corporate Systems Division. Duties will primarily involve sales support, including developing brokerage applications for a totally on-line system. You should have experience with BAL, CICS, DOS/OS and TSO. Knowledge of brokerage functions and data base management would be assets.

SYSTEMS & APPLICATIONS PROGRAMMERS

Requires a background in programming in FORTRAN/Macro Assembler and at least one year of experience working with Data General equipment. Success in these positions could lead to higher level systems programming or applications roles - depending on your goals

We have many more openings for Programmers/Analysts with all levels of experience.

For more information, send for an application to: L.D. Kelly, Employment Dept., Merrill Lynch, 1 Liberty Plaza (165 Broadway), New York, NY 10080.

Merrill Lynch
Pierce Fenner & Smith Inc.

Merrill Lynch is an Equal Employment Opportunity employer and encourages applications from females, minorities and all other persons.

MANAGER SYSTEMS DEVELOPMENT

Univ. of California
Systemwide Admin.

Exciting opportunity for the right Systems Development Manager. We have just established a new Corporate Systems Development organization to plan and implement information systems in a new Distributed Systems environment.

Responsibilities include management of all phases of new information systems development, from proposal to programming, for the University's Systemwide Management Team. Planning and Budgeting for corporate systems staff, hardware, and software will be a major responsibility for this manager.

Benefits are generous, including five weeks annual vacation. Salary range $23,500-$33,100.

We require broad and successful information systems project management experience in a large organization. Ability to communicate well is essential. We prefer an MBA or equivalent plus five-seven years systems development experience. Send resume to: Box 33 University of California Personnel Office, 2539 Channing Way, Berkeley, California 94720. An equal opportunity employer.

If you have questions, please call Mr. Conley (415) 642-6581.

Computer Operator

For Washoe Medical Center in Reno, Nevada. Minimum 1 year experience with disc and tape. Competitive salary, liberal benefit package including State Retirement Plan and excellent, stable working conditions.

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DATA PROCESSING

SYSTEMS ANALYSTS, PROGRAMMER ANALYSTS SYSTEMS PROGRAMMERS

BURROUGHS WELLCOME CO., a long-established manufacturer of drugs and pharmaceuticals, is seeking highly motivated, career-oriented data processing personnel.

SYSTEMS ANALYSTS

Responsibilities will include evaluation of user requirements for business systems in the areas of manufacturing and finance, development of systems architecture, and detailed systems specifications.

Requirements include a B.S. degree in Statistics, Mathematics, Accounting, Computer Science, or equivalent experience/training as an Analyst. Minimum of four years experience as a Systems Analyst in a Data Base environment for business systems, including COBOL or PL/I, is necessary. IMS exposure a definite plus.

PROGRAMMER ANALYSTS

Responsibilities will include application software development in an IMS Data Base environment, including program coding, test data generation, and implementation responsibilities.

Requirements include a B.S. degree in Computer Science or equivalent experience/training as an analyst, and a minimum of three years data processing experience in all aspects of programming, testing, and debugging programs in PL/I or COBOL. Must be able to prepare documentation for users and have good oral and written communication skills.

SYSTEMS PROGRAMMERS

Responsibilities will include defining and programming moderately complex software such as utility programs, catalogued procedures (job control language), macros and subroutines. Will assist in or be responsible for complex software installations such as system control program generation.

Requirement include a B.S. degree in Computer Science or equivalent experience/training as a Systems Programmer and a minimum of one year experience with OS/VS1 or OS/VS2 software in systems programming or applications maintenance programming. Working knowledge of macro assembler language programming and good oral and written communication skills are also necessary. MVS experience a definite plus.

BURROUGHS WELLCOME CO. facilities are located in the beautiful Research Triangle Park area of North Carolina. The Triangle Park area, surrounded by Durham, Raleigh, and Chapel Hill, provides not only superior living and recreational opportunities, but also moderate winters, pollution and smog-free summers, and a reasonable cost of living.

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Systems Analysts, Programmer Analysts, and Systems Programmers who meet the job requirements and are interested in joining an innovative, dynamic organization should send a resume detailing education, training, work history, D.P. equipment and language experience, and salary requirements to: Employment Supervisor, **BURROUGHS WELLCOME CO.**, 3030 Cornwallis Road, Research Triangle Park, N.C. 27709.

If you do not have an up-to-date resume readily available, call Clyde Rush, COLLECT (919) 549-8371, Ext. 292 to apply.

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Minimum of two years experience in programming using BAL, ANSI COBOL and/or FORTRAN IV in an IBM 360/370 environment. Bachelors degree in Science, Engineering or Business preferred but not required.

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Minimum of five years data processing experience of which two must have been in systems analysis and design. Bachelors degree in Science, Engineering or Business preferred but not required.

We offer an excellent benefit package, including relocation assistance, attractive geographic location and salaries commensurate with candidates' qualifications and experience.

Qualified candidates who wish to be considered for the above positions should send their resumes, including salary history, in confidence to:

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Starting salary is in the $20,000 — $22,000 range with an excellent benefits package including four weeks vacation. Please send your resume in confidence to:

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Minimum Qualifications: College graduate with at least five years of data processing experience, two years of which must be in data base design or administration. Preference given to experience in IMS, DL/I, DC, and large systems. Successful candidate will control data base activities at LSU and will supervise the activities of two junior DBA's. The salary is very competitive with a 3033 support computer. Send confidential resume to:

Dr. John M. Tyler
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Candidate should have a strong academic background and technical expertise gained from 3 to 5 years experience in the area of business systems development. Significant experience with hardware/software evaluation, distributed processing, minicomputers, and/or telecommunications would be beneficial. Above average problem solving ability and excellent communication skills are required. Some travel is required.

Challenging work in a very professional environment make this position attractive. Compensation is commensurate with ability and experience, and includes a bonus and excellent fringe benefits.

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Administrative systems. Design through documentation, planning, supervision and instruction require: 2- or 4-year related degree; 2-4 years' Programmer or Analyst experience, including significant PL/1 applications and IBM 360 or 370 systems; good communication and interpersonal skills. BASIC and OS/360 experience helpful. Full-time, year-around position, offering salary based on qualifications, plus full benefits. Call 414-739-3681, or send letter and resume, including expected salary range and names of references to Mr. R. Whitcomb, Personnel Director, P.O. Box 599, Appleton, Wi 54912.

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For consideration, please send a resume with salary and education history in confidence to Milt Williams, SFOKM - United Airlines, San Francisco International Airport, San Francisco, CA 94128. Or call collect (415) 876-4131. United is an equal opportunity employer.

UNITED AIRLINES

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You will be involved in systems training, developing and debugging software and act as a consultant in providing technical support in the correction of deficiencies and the design of new systems.

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Evansville, Ind. Location

Division headquarters of multi-national corporation has immediate opening for a computer programmer. Degree preferred and 3 to 5 years experience. Qualified applicants must be knowledgeable in R.P.G. II and COBOL. Some O.S. experience desirable. Should have worked on IBM Systems/34 or an IBM System/3. This is an excellent opportunity to join a major corporation. Salaries 15-18K, full range family benefit package, company paid relocation, excellent advancement potential.

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EOE M/F

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Your responsibilities will consist of educating customers, systems analysts and Marketing staff in the operation of our business systems. You will have an opportunity to be creative and develop curriculum associated with these products. This position requires a person who is a self-starter and who has 2-3 years experience in the following areas;

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- Development experience - course design through implementation.
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- Creative writing skills.
- Ability to work with various organizations and take on project responsibilities.
- Prefer college education or specialized training in this area.

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- Who is creative and self-starting
- Who has at least 3 years experience in the following areas:
  - — Instructional experience in hardware and/or Operating Systems to Customers. Prefer Virtual Storage Systems
  - — Knowledge of interactive and time sharing systems
  - — Field Experience as a Systems Analyst/Programmer with applications knowledge
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- Who has excellent communication skills.

If you have the experience and are interested in any of these growth positions, we want to speak with you.

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Interactive Transaction Processing
Pascal-based OS Language
Firmware Emulation
Advanced DLC Protocols

NCR has started EDP action for the Eighties.

The coming decade will see the massive infusion of computing technology into business and industry. Much of it will come from NCR's San Diego facility, where we design and build large-scale computer systems. These systems are being developed to anticipate the escalating needs of business in the 80s, using the most sophisticated application techniques.

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- **Distributed Network Architecture**
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- **Interactive Processing**
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- **MICR Proof Of Deposit Software**
- **Systems Architecture**
- **Tools Support**
  — time-sharing — compiler designs/developments (high-level block structured languages) — SW tools design
- **Distributed intelligence Architecture/Interactive Systems Software Architecture**
- **Fifth Generation OS Architecture/ Interactive Systems Software Architecture**

WHAT'S NEW AT NCR?

NCR is on the move. We've mounted a major, coordinated effort, backed by ample R&D resources, to emerge up front in 1980s EDP. For example: VLSI technology, distributed network architecture with interactive transaction processing and important new functions, advanced communication and I/O protocols, high-level PASCAL-based language, powerful new virtual systems, and advanced concepts in microprocessor-based terminals.

Mr. George Rice, Manager, Professional Placement, Engineering and Manufacturing, Dept. G50, NCR Corporation, 16550 W. Bernardo Drive, San Diego, California 92127.

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A major Houston area energy company has created a new data processing management position with two systems managers report to it. Emphasis will be on maturity in human relations and corporate leadership capabilities and systems development. A recent background in an IBM 370/OS, COBOL environment is required; and data base experience would be helpful, but an energy industry background is not necessary.

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Saxon Business Products, inc., a major Miami headquartered leader in the expanding photocopier industry is currently seeking professionals for its expanding MIS department. Continued growth has necessitated the upgrading of our hardware and software to support our Distribution, Marketing, Manufacturing and Financial groups. Honeywell Level 66 experience desired although a Honeywell 2000 background combined with a willingness to upgrade one's technical skills would be considered. We have a GCOS operating system utilizing DM IV software; IDS II data base, NPS, TPS and Cobol 74.

SYSTEMS ANALYSTS

Business applications experience in diversified disciplines including order processing, financial and inventory systems. Heavy user interface experience in the private business sector a must.

PROGRAMMER ANALYSTS

Two to three years of Cobol programming experience in Marketing, Manufacturing of Financial areas. While the majority of our openings are for Level 66 experienced candidates, we can accomodate a limited number of Honeywell 2000 or IBM experienced personnel desirous of learning our new software systems.

TECHNICAL SUPPORT ANALYSTS

Experienced in providing vendor software support, hardware/software problem analysis, programming/ operations support and establishing technical requirements. Must be experienced in Honeywell GCOS operating system.

LEAD OPERATOR

Operator experience on Honeywell 6000 hardware and related peripheral equipment. Must be capable of identifying causes of computer malfunctions, performing test operations, setting up and operating peripheral equipment, maintains operational schedules and directing other operators.

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- **B.S. or equivalent**
- **Willing to relocate in Las Vegas**

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PROGRAMMER ANALYST

Immediate Opening

To analyze and develop computer programs for scientific and management applications. Work with researchers and management to fulfill their computer needs. Modify and document existing programs as required, and write usage and procedure manuals.

REQUIREMENTS: BS with emphasis in statistics and/or mathematics or MS in computer science. FORTRAN experience necessary; some Assembler experience on IBM 1800, IBM 1130 or PDP-11/24 helpful. Will consider recent graduates. Send resume with references and salary history to:

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COMPUTERWORLD

CAREER OPPORTUNITY IN COMPUTER ADMINISTRATION

The University of California's Los Alamos Scientific Laboratory, a multi-faceted national R&D facility, is seeking a user-oriented professional to work in its Computer Sciences and Services Division.

As part of the Customer Service Group, the incumbent will assist Laboratory divisions with computing system acquisitions within requirements set forth by the Department of Energy (DOE). The position involves coordination of proposals for hardware, software, and related computing services; review of Laboratory requirements for new computing applications and for enhancements of the Laboratory's several hundred currently installed systems; preparation of formal DOE proposals for acquistions exceeding approval authority; interface with internal and external administrative organizations; and participation in the development of responsive Laboratory-wide computer policies and plans.

The successful candidate must have a B.S. or M.S. in computer science or related field, or in other degree field with strong relevant computer background; and must be able to communicate effectively with both technical and administrative personnel. Experience with software/hardware development, especially in systems configuration, is preferred.

The Laboratory's powerful computing facilities include a CRAY-1 computer, four CDC 7600's, two CDC 6600's, two CDC Cyber 73's, an IBM 370/148, and numerous minicomputers, all operating in a network environment.

We provide excellent working conditions and benefits, such as 24 days' annual vacation. Our location in the mountains of northern New Mexico offers a pleasing lifestyle in a setting of great natural beauty: abundant recreational activities; a pollution-free environment; casual, uncrowded living; a superior school system; and low taxes.

Please send complete resume, in confidence, to:

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Los Alamos Scientific
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P.O. Box 1663
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Dynamic Systems Development div. of a major manufacturing co. is expanding its resources for the express purpose of future systems development. Selected individuals will possess a superior knowledge of one or more of the specified disciplines (Manufacturing, Financial, or Engineering Systems) plus a demonstrated ability in Systems Analysis & Design. Experience with large scale, data base oriented systems preferred. Knldg. of available software packages and ability to evaluate their usage is helpful.

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INFORMATION SYSTEMS OPPORTUNITIES

The Government Products Division of Pratt & Whitney Aircraft has a number of attractive openings in West Palm Beach for Management Information Systems-oriented individuals. Desirable background for these positions should include an appropriate degree, data base experience for new systems development, and 2-7 years experience in one or more of the following areas.

SYSTEMS DEVELOPMENT ANALYSTS

Product Support Systems

- Cobol experience
- Emphasis on order entry commercial applications

Financial Systems

- Must understand inter-relationship of all financial systems functions
- Applications DB design experience desirable

Manufacturing Systems

- Experience in user requirements definition, system design, development and implementation in a job shop manufacturing environment

Data Administration

- Experience in classifying and cataloging data
- Data dictionary or DBMS experience
- Familiar with business systems planning methodology

SCIENTIFIC APPLICATIONS

- Experience in FORTRAN Scientific Application Programming
- Mini computers and data acquisition experience desirable

Hardware utilized at Government Products Division include:

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The Environment: IBM 370/168, MVS, IMS DB/DC, TSO.

Prerequisites: Previous project leadership responsibilities including exposure to data base and teleprocessing design. Large scale integrated systems experience and a college degree are desirable but not required.

The Location: Hennepin County (Minneapolis and suburbs), a nationally recognized prime quality of life area offers an abundance of year round recreational and cultural activities.

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Chief, Management Information Systems

Announcement Number 2130G-36-02
Salary Range $25,189 - $33,758

A top administrative position with direct impact in decision making processes. Overall responsibility for organizational structure, policy, goals, and objectives as well as evaluation of the division.

Minimum Qualifications:

Graduation from college with major course work in Business or Public Administration, Systems Design, or closely related fields. (Master's Degree is preferred). A minimum of five (5) years of experience in Systems Design including some administrative experience is required. An equivalent combination of education and experience will be accepted in identifying qualified applicants.

Senior Systems Analyst

Announcement Number 1483G-30-02
Salary Range $18,782 - $25,189
Two (2) Positions available

This is advanced technical work in Data Processing Systems. The position requires the incumbent to work with a great deal of independence and assume responsibility for planning and management within assigned areas.

Minimum Qualifications:

Applicants must have a Bachelors Degree with training in Business Administration, Systems Design and/or Computer Science. Five (5) years of experience in Data Processing, three (3) of which have been in programming and systems design is also required. Knowledge of COBOL Programming, Data Base, and Tele Processing is desirable. An equivalent combination of education and experience will be accepted in identifying qualified applicants.

SENIOR PROGRAMMER

Announcement Number 1473G-29-01
Salary Range $17,909 - $23,982

This is advanced technical work which is primarily concerned with the preparation of various operating instructions for an electronic digital computer system.

Minimum Qualifications

Applicants must be high school graduates and have supplemental coursework in programming, Business Administration, Engineering, or closely related fields. Knowledge of DEC Assembly Language is required. Experience with RSX-11M operating system and support of telecommunications on a 16bt minicomputer is highly desirable. An equivalent combination of education and experience will be accepted in identifying qualified applicants.

PROGRAMMER TRAINEE

Announcement Number 1470G-19-01
Salary Range $10,920 - $14,474

This is basic technical work in the development and maintenance of computer programs.

Minimum Qualifications

Applicants must be high school graduates with additional coursework in computer programming, either from computer manufactures or at college or technical school level and at least six (6) month's experience in Data Processing. An equivalent combination of education and experience will be accepted in identifying qualified applicants. Position has promotional potential after nine (9) months.

SEND RESUMES/APPLICATIONS TO:

Central Personnel Office
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Upper Marlboro, Maryland 20870
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(301) 952-3610
for Information
CLOSING DATE: October 16, 1978

SOFTWARE PROGRAMMER

Denver

Rapidly growing energy resource service company headquartered in Denver has immediate need for a light to intermediate level Software Programmer to work with data base support group using IDMS on IBM 370/145, DOS/VS. Minimum 1 year IDMS experience. TP or system programming experience helpful. Send resume including salary requirements to:

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Minimum of 5 years experience in FORTRAN and Assembly language programming of scientific and real-time applications. Familiarity with minicomputer architecture and at least one of the following operating systems is required: DEC RSX-11M, DG-RDOS.

• Scientific Applications Programmer

BS degree in Engineering, Science or Math with major credits in Computer Science or equivalent computer programming experience. Should have experience in FORTRAN for scientific applications. Familiarity with a minicomputer operating system an asset.

SYSTEM PROGRAMMER

To aid in the development of interface Drivers in Assembly language for a variety of minicomputers and to implement FORTRAN support systems including an assembler and simulator.

You will have a minimum of 2 years experience on the systems level in one or more minicomputer operating systems, such as: VAX, PDP-11 Series, NOVA/ECLIPSE, HEWLETT-PACKARD, INTERDATA and VARIAN. Strong Assembly language and FORTRAN skills required.

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SENIOR SYSTEMS ANALYST

The successful candidate will have as a minimum a bachelor's degree and 5 to 8 years of solid systems design and implementation axperience with a track record of continuous professional growth and increasing achievement, including successful project leadership experience. A strong technical background with emphasis on design of both batch and on-line systems solutions is required, as is a working knowledge of telecommunications concepts.

Prior axperience with financial systams is highly desirable, especially in the areas of financial data base, reporting and analysis systems, larga scale financial consolidations, and currency translation. The candidate must be capable of designing and implementing financial applications on a variety of computing hardware - both main frames and dedicated systems utilizing both custom developed and packaged softwara. Familiarity with timesharing and service bureaus is highly desirable.

This position requires excellent oral and written communication skills, a high degrae and quality of user interface, and the ability to work effectively as part of a small team that bears complete responsibility for davalopment and implementation.

LEAD PROGRAMMER

Two positions available. The successful candidate will possess 2 to 4 years of experiance, with a minimum of 2 yaars of course work (B.S. degree preferred) in an appropriete discipline.

For one of these positions, the ideal candidate will possess large mainframa experience. Heavy COBOL is required, with good FORTRAN desirable. A working knowledge of the operating system and job control is essential. Experience of working with or in a service bureau environment is desirable.

For the other position, the ideal candidate will have indapth experience with IBM System 34, System 32, or System 3 utilizing RPG/II. Working knowledge of System utilities, programming aids, and job control is essential.

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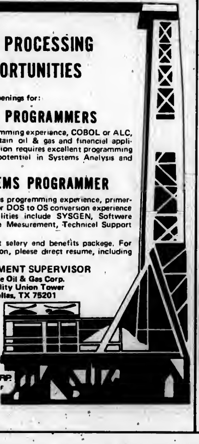

Data Processing

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Immediate opportunities are available for Software Development Professionals in a broad range of disciplines at all experience levals. Preferred background should include experience in design and implementation in the following areas:

- Operating Systems
- File Systams
- Data Base Management Systems
- Compiler and Assemblers
- Linkage Editors
- System Utilities
- Communications Systams
- Onlina, Interactiva Systams
- Hardware Diagnostics
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- I/O Drivers

B.S. or M.S. in Computer Science or ralated field and Assembly language experience required. Davalopment experience on minicomputer or microprocessor systems and familiarity with structure design and programming techniques praferred.

We offer excellent starting salaries, tha stimulation of working in a highly professional environment, and a company aiming at excellence in its industry. Our comprehensive benefits including medical/life/disability insurance, a stock purchase plan, tuition assistance program, retirament plan, and paid ralocation.

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SYSTEMS ANALYST PROGRAMMER

Weltronic Co., an industry leader in the design and implementation of automated plant monitoring and control systems has an opening for a systems analyst programmer. Position requires experience in a real time disk based minicomputer environment, preferably in the manufacturing monitoring and control area. Prior use of structured design and programming methods desired. FORTRAN and Assembly language experience a must. Person must be capable of taking a system from conception to installation. Requires ability to interface with customers and engineers. Approximately 20% travel involved.

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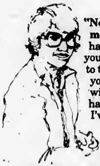

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SR. SYSTEMS ANALYST

Responsible for providing DP systems consultation to affiliates including conducting requirement studies, systems design reviews and testing, providing detailed design and programs specifications, user and technical staff training and assuming project supervision. Qualifications required include advanced academic training and professional experience with expertise in COBOL and OSJCL. Project leadership and consulting experience preferred. Data base experience helpful.

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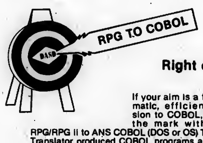

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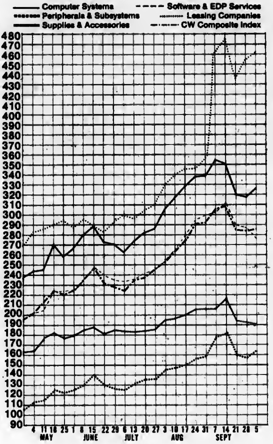

Earnings Reports

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Three Months Ended June 30

	1978	a1977
Shr Ernd		$ 40
Revenue	$4,045,752	3,515,894
Tax Cred		207,050
Earnings	(269,543)	327,342
6 Mo Shr		38
Revenue	8,603,312	7,026,544
Tax Cred		207,050
Earnings	(612,941)	509,016

a-Restated to reflect a change in accounting method

TELESCIENCES
Three Months Ended June 30

	1978	1977
Shr Ernd	$ 30	$ 23
Revenue	6,711,278	5,196,586
Earnings	962,858	723,513
6 Mo Shr	.35	42
Revenue	12,676,262	9,932,330
Earnings	1,744,254	1,317,691

VARIAN ASSOCIATES
Three Months Ended June 30

	1978	a1977
Shr Ernd	$ 47	$ 42
Revenue	107,885,000	88,309,000
Earnings	3,511,000	3,172,000
9 Mo Shr	1.03	1.11
Revenue	290,563,000	257,262,000
Earnings	b7,721,000	8,381,000

a-Restated b-Includes net gain of $713,000 from sale of interest in a joint venture less write-off of goodwill of a subsidiary.

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Year Ended June 30

	1978 (000)	1977 (000)
Shr Ernd	$2 60	$2 22
Revenue	1,155,157	920,253
Earnings	48,200	37,055
3 Mo Shr	1.08	83
Revenue	329,651	293,238
Earnings	17,463	13,898

PERTEC COMPUTER
Three Months Ended June 30

	1978	1977
Shr Ernd	$ 23	$ 24
Revenue	35,301,000	a29,137,000
Earnings	1,540,000	1,471,000

a-Restated

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(Required by 39 U.S.C. 3685)

1. Title of publication: Computerworld
2. Date of filing: October 2, 1978
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	Average No. Copies Each Issue During Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
A. Total number of copies printed (net press run)	96,115	100,596
B. Paid circulation		
1. Sales through dealers and carriers, street vendors and counter sales	None	None
2. Mail subscriptions	86,994	94,606
C. Total paid circulation	86,961	91,504
D. Free distribution by mail, carrier or other means, samples, complimentary and other free copies	3,033	3,102
E. Total distribution (Sum of C and D)	89,994	94,606
F. Copies not distributed		
1. Office use, left over, unaccounted, spoiled after printing	6,121	5,990
2. Returns from news agents	None	None
G. Total (Sum of E, F1 and 2 - should equal net press run shown in A)	96,115	100,596

I certify that the statements made by me above are correct and complete.

W. Walter Boyd
President

TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOBER 4, 1978

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

EXCH		AAICE			
		1978 AANGE (1)	CLOSE OCT 4 1978	WEEA NET CHNGE	WEEK PCT CHNGE

COMAUTER SYSTEMS

A	AMDAML COAP	28- 69	31 3/4	-3 5/8	-6.3
N	BUPAOUGHS CORP	39- 87	76 1/4	+ 1/8	+0.1
O	COMPUTER AUTOMATION	23- 44	31 1/4	-1 3/4	-3.3
N	CONTAOL DATA CORP	23- 44	38 1/4	+1 3/4	+4.7
O	CRAY AESEAACH INC	21- 74	67	+6	+9.8
N	DATA GENEAAL COAP	42- 71	39 3/4	-2 1/8	-3.4
N	OATAADIN7 CORA	34- 73	64 5/8	-1	-1.3
N	DIGITAL EQUIAMENT	39- 34	48 3/A	- 1/8	-0.2
N	ELECTADNIC ASSOC.	2- 13	10 1/4	+ 1/2	+5.1
A	ELECTRONIC ENGINEER.	11- 19	14 3/8	- 1/8	-0.8
O	FOUA-PHASE SYSTEMS	19- 46	38	- 7/8	-2.2
N	FOXBOAO	28- 40	37 1/4	0	0.0
O	GENEAAL AUTOMATION	7- 26	17 1/2	- 3/8	-3.4
O	GRI COMPUTEA CORP	1- 2	2 1/2	+ 3/4	+42.8
N	HEWLE7T-AACAAAD CO	62- 93	87 5/8	+ 3/4	+0.8
N	HOMEYWELL INC	43- 72	65 7/8	+1 1/2	+2.3
N	IBM	236-303	282	+7	+2.3
O	MANAGEMENT ASSIST	9- 29	23 1/4	+1 3/4	+8.1
O	MICRODATA COAP	10- 23	17 7/8	- 3/8	-3.3
O	AIMI-COMPUTER SYST	3- 8	7 1/2	0	0.0
O	MODULAA COMPUTER SYS	7- 17	14 3/4	+1 1/4	+9.2
N	MCA	37- 67	81 1/2	+1 7/8	+3.1
N	ABIME COMAUTER INC	20- 43	36 1/8	+ 7/8	+2.4
N	PEAKIN-ELMER	17- 28	27	+2	+8.0
N	RAYTMEON CO	29- 38	47 5/4	+ 3/8	+0.7
N	SPEAAY AAND	53- 49	43 3/8	- 5/8	-1.4
A	SYSTEMS ENG. LABS	11- 24	17	+ 1/4	+1.4
A	WANG LABS.	12- 32	26 5/4	+1 3/8	+3.4

LEASING COMPANIES

C	BOOTHE COURIEA,CORP	13- 20	20 1/2	+1 1/4	+6.4
O	COMDISCO INC	3- 20	19 1/4	+1 1/2	+8.4
A	COMMEACE GAOUP CORA	1- 1	5/8	0	0.0
A	COMPUTER INVSTAS GAP	1- 7	4 3/4	- 1/2	-9.5
N	DATRONIC AENTAL	1- 3	2 1/2	+ 1/4	+11.1
A	DCL INC	3- 5	4	- 3/8	-8.5
N	DPF INC	8- 14	12 5/8	+1 1/4	+10.9
N	ITEL	16- 38	32 1/2	+ 5/8	+1.9
N	LEASCO CORP	24- 36	32	+ 5/8	+1.9
O	LEASAAC CORA	1- 4	2 1/2	0	0.0
A	AIONEEA TEX CORA	4- 7	4 3/4	- 1/4	-5.0
N	U.S. LEASING	13- 20	17 7/8	0	0.0

EXCH: N=NEW YOAK; A=AMERICAN; P=AHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C ARICES AAE BID AAICES AS OF 3 P.M. OR LAST BID
(1) TO NFAAEST DOLLAR

ERCH		AAICE			
		1978 RANGE (1)	CLOSE OCT 4 1978	WEEA NET CHNGE	WEEK PCT CHNGE

SOFTWARE & EDP SERVICES

O	ADVANCED COMP TECH	1- 2	1 3/8	- 1/8	-8.3
O	AMACOMP INC	8- 22	16	- 1/4	-1.5
A	AAPLIED DATA RES.	8- 17	14 1/8	- 7/8	-5.8
N	AUTOMATIC DATA PROC	24- 38	32 5/4	+1 3/4	+3.6
O	COLEMAN AMERICAN COS	1- 2	1 1/2	0	0.0
O	COMPU-SERV NETWORA	7- 12	8 1/2	+ 1/4	+3.0
O	COMPUTER HORIZONS	1- 9	6 5/4	-1 1/2	-18.1
O	COMAUTEA METWOAK	8- 16	11 3/4	- 1/8	-1.0
N	COMPUTER SCIENCES	8- 17	13 7/8	- 1/8	-0.8
O	COMPUTEA TASK GAOUA	1- 4	3 1/4	0	0.0
O	COMAUTER USAGE	2- 4	3 3/4	0	0.0
C	COMSHAAE	6- 19	16 1/4	-1	-5.7
O	DATA DIMENSIONS INC	4- 9	7 3/8	+ 1/4	+3.3
O	DATATAB	1- 2	1 1/2	+ 1/8	+9.0
N	ELECTRONIC DATA SYS.	15- 25	21 3/8	- 1/2	-2.2
O	INSYTE CORP	1- 3	1 5/8	- 1/8	-7.1
O	IAS COMPUTER MARKET.	2- 5	3	- 1/4	-7.6
O	XEANE ASSOCIATES	3- 6	5 5/8	- 3/8	-10.4
O	KEYDATA COAA	1- 3	2 1/8	+ 1/8	+6.2
A	LOGICON	11- 19	13 1/4	0	0.0
A	MANAGEMENT DATA	1- 1	1/8	- 3/4	-83.7
A	NATIONAL CSS INC	13- 36	29 3/8	-1 1/4	-4.0
O	NATIONAL DATA CORA	7- 13	10 7/8	0	0.0
A	ON LINE SYSTEMS INC	17- 30	26	- 5/8	-2.3
N	PLANNING AESEAACH	4- 10	8 7/8	+ 1/4	+2.8
O	AAOGAAMMING & SYS	1- 1	1 1/2	+ 1/4	+20.0
O	AAPIDATA INC	3- 7	6	- 1/2	-7.6
O	AEYMOLDS & AEYNOLD	18- 56	29	+ 1/2	+1.7
O	SCIENTIFIC COMPUTEAS	3- 9	8	- 5/8	-4.4
O	TYMSHARE INC	18- 33	27 7/8	+ 1/2	+1.8
A	URS SYSTEMS	5- 8	7 1/4	- 3/8	-4.9
N	WYLY CORA	1- 7	6 1/8	+ 1/4	+4.2

PERIAMERALS & SUBSYSTEMS

N	ADDRESSOGRAAH-MULT	14- 32	28 1/4	+1 5/8	+6.1
O	ADVANCED MEMDAY SYS	7- 18	17 1/8	+ 3/4	+4.5
N	AMPEX CORA	10- 19	17	+ 3/4	+4.8
O	AMDEASON JACOBSON	3- 10	7 1/2	- 1/4	-3.2
N	AAPLIED GIG DATA SYS	13- 22	14 7/8	+ 1/2	+3.4
O	BEEHIVE INT'L	4- 7	5 7/8	- 1/2	-7.8
A	BOLT,BEAANEA & NEW	6- 14	13 1/8	- 3/8	-2.7
N	BUMAEA-AAMO	10- 20	18 5/8	+1 5/8	+9.5
A	CALGOMA	3- 13	11	+ 1/8	+1.1
O	CAMBRIDGE MEMORIES	3- 9	8 1/4	- 3/8	-5.6
N	CENTAGNICS DATA COMP	16- 36	38 1/4	+2 3/4	+8.2
O	COGNITRONICS	1- 4	2	- 1/4	-11.1
O	COMPUTFA COMMUN.	6- 12	10 1/4	+ 1/4	+2.5
O	COMPUTER CONSOLES	4- 10	8 1/2	- 1/4	-2.8
A	COMPUTER EQUIPMENT	3- 6	3 1/4	+ 1/8	+2.4
O	COMPUTEA TRANSCEIVER	1- 3	5 3/8	+ 1/4	+8.0
O	COMTEM	9- 38	33	+1 1/4	+3.9
N	COMBAC CORP	19- 26	21 1/2	- 1/4	-1.1

FRCH		PRICE			
		1978 RANGE (1)	CLOSE OCT 4 1978	WEEA NET CHNGE	WEEA ACT CHNGE
O	DATA ACCESS SYSTEMS	3- 14	12	0	0.0
O	OATA 100	9- 20	19 1/4	0	0.0
A	OATA AROOUCTS COAA	13- 25	20 1/2	+2	+10.8
O	DATUM INC	2- 6	4 3/8	0	0.0
O	DECISION DATA COMPUT	2- 6	4 5/4	+ 3/8	+8.5
O	DELTA DATA SYSTEMS	1- 1	5/4	+ 1/8	+20.0
A	DOCUMATION INC	6- 34	28	-1	-3.4
O	DATARAM CORA	6- 31	28 1/4	+1 3/4	+6.8
N	ELECTAONIC M & M	4- 9	7 1/8	+ 1/2	+7.3
O	FABRI-TEA	1- 2	1 1/4	- 1/8	-8.6
O	GENERAL COMPUTER SYS	1- 5	2 1/4	- 1/8	-5.2
N	HAZELTINE CORP	10- 17	16 5/4	+1 3/4	+11.6
N	HARRIS CORA	17- 36	33 1/8	+1 1/8	+3.3
O	INFOREX INC	6- 11	9 7/8	+ 3/8	+3.9
O	INFORMATION INTL INC	8- 12	9 1/4	- 1/2	-3.1
O	INTEL CORP	39- 62	53	+2 1/2	+4.7
A	LUNDY ELECTRONICS	4- 8	7 1/2	+ 5/8	+9.0
O	MSI CATA COAA	12- 19	13 3/4	- 7/8	-3.9
N	MEMDAEX	27- 59	48 3/4	+ 1/4	+0.5
N	MOHAWA DATA SCI	6- 15	11 1/8	- 1/4	-2.1
O	OMEX	2- 4	5 1/2	+2	+37.1
O	PEMAIL COAA	3- 12	11 3/4	+1 3/4	+17.3
N	AEPTEC CORA	9- 17	13 1/8	+ 3/8	+2.3
A	AOTTEA INSTAUMENT	2- 2	1 3/4	0	0.0
O	QUANTOA CORP	2- 5	2 1/2	0	0.0
O	AECOGNITION EQUIP	7- 13	10 3/8	- 1/4	-2.2
O	SCAN DATA	1- 5	2 3/8	- 1/4	-10.4
N	STOAAGE TECHNOLOGY	19- 46	32 3/4	+1 3/4	+3.6
O	T BAP INC	11- 20	17 3/4	- 3/4	-4.0
O	TALLY COAP.	4- 9	7 1/2	- 1/8	-1.6
A	TEC INC	6- 13	10 1/2	- 1/2	-4.3
N	TEATRONIR INC	33- 50	47 1/4	+ 3/4	+1.6
N	TELEX	3- 9	7 1/2	0	0.0
O	TESDATA SYSTEMS CP	13- 23	13 1/2	0	0.0
O	WILTEA INC	1- 1	1 3/8	+ 1/2	+37.1

SUAPLIES & ACCESSORIES

A	AMERICAN BUS PRODS	6- 11	9 3/8	- 3/8	-3.8
O	BALTIMORE BUS FOAMS	2- 5	2	- 1/2	-20.0
A	BAARY WRIGHT	14- 30	28 1/2	+2 1/4	+8.5
O	CYBEAMATICS INC	1- 1	1	0	0.0
O	DUALER AROOUCTS INC	18- 30	25 3/4	- 1/2	-1.9
N	ENNIS BUS. FOAMS	8- 17	13 1/2	+ 5/8	+4.8
N	3M GOMAANY	43- 66	58 5/8	0	0.0
O	MODAF COAP LTD	26- 34	30 3/4	+ 5/4	+2.5
N	NASHUA CORP	19- 37	27 5/8	-4 1/8	-12.9
O	STANDARD REGISTER	20- 27	25	+ 1/4	+1.0
A	TAB AROOUCTS CO	8- 16	14 1/4	+ 1/8	+0.8
N	UAACO	19- 28	26 5/8	+1	+3.9
A	WABASH MAGNETICS	10- 22	20	+ 3/4	+3.8
N	WALLACE BUS FORMS	18- 33	27 3/4	- 1/2	-1.7

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